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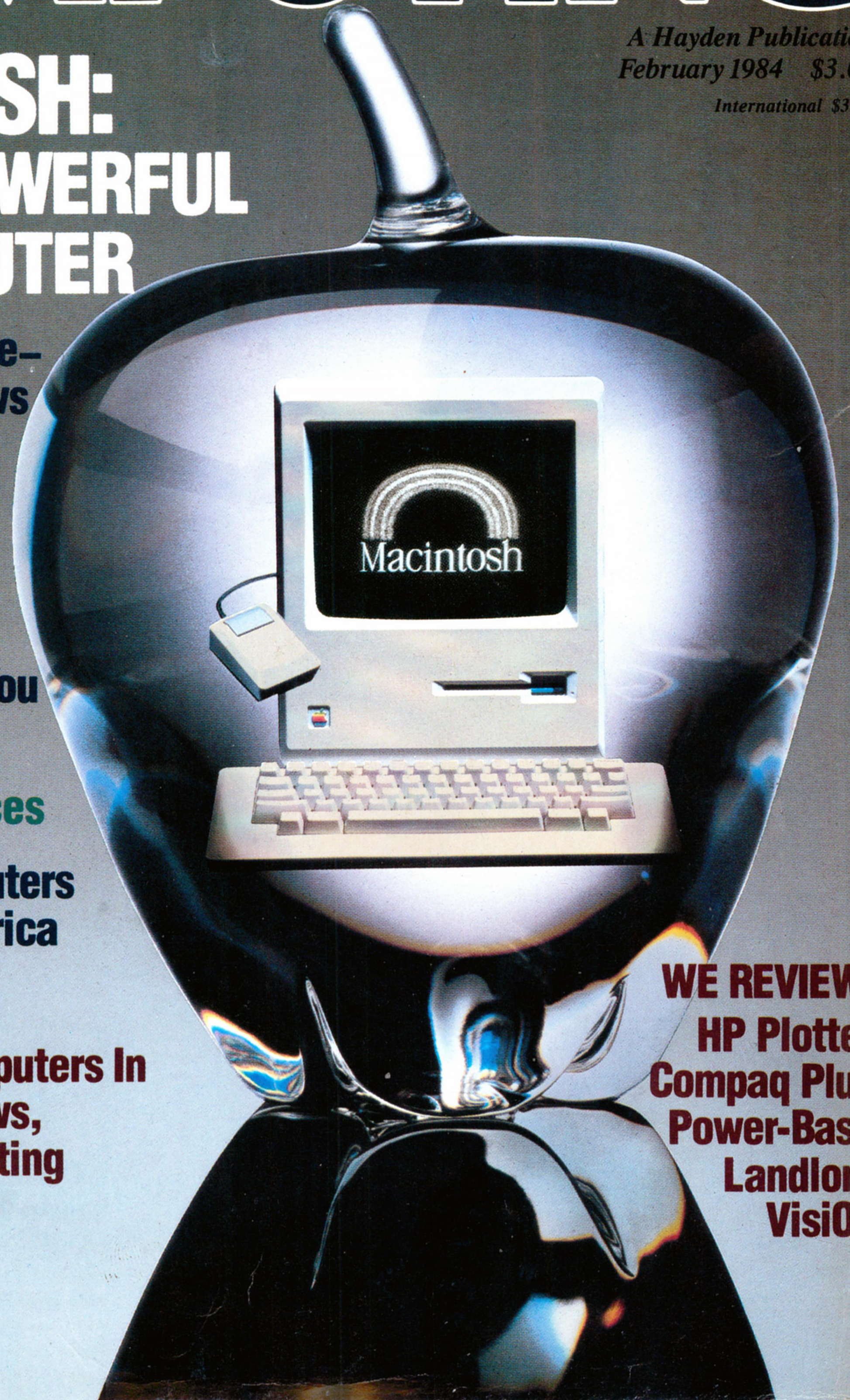

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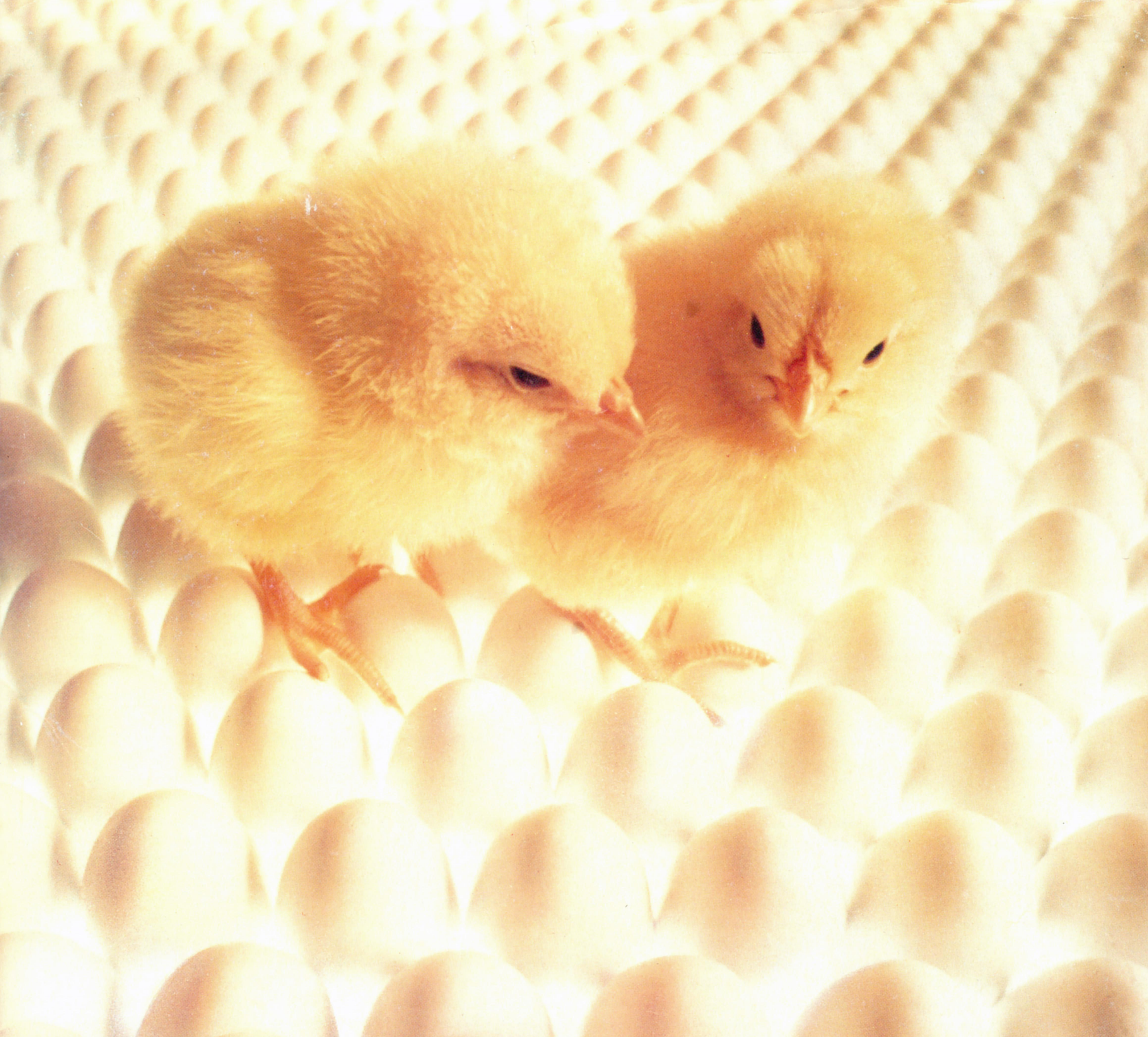
HP Plotter
Compaq Plus
Power-Base
Landlord
VisiOn



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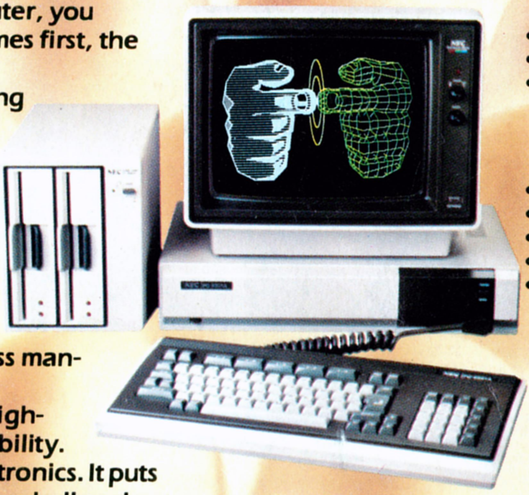

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February 1984
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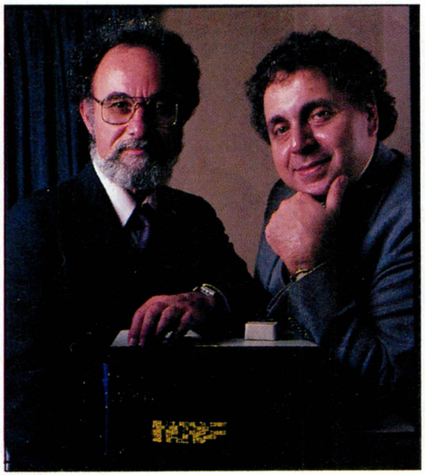
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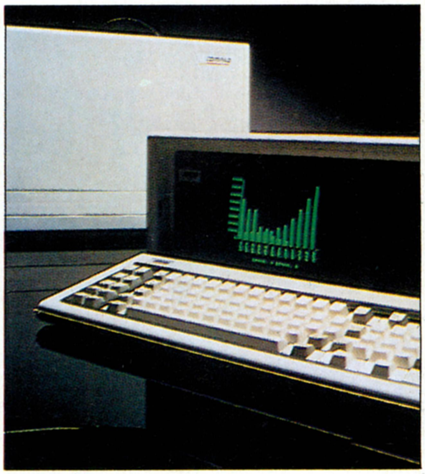
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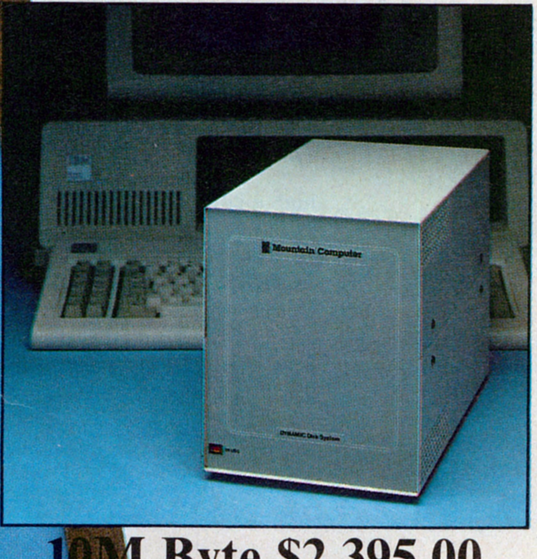

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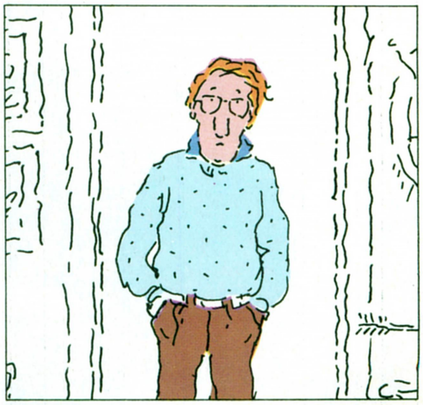

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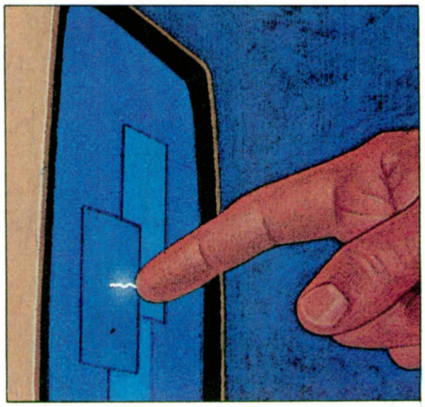

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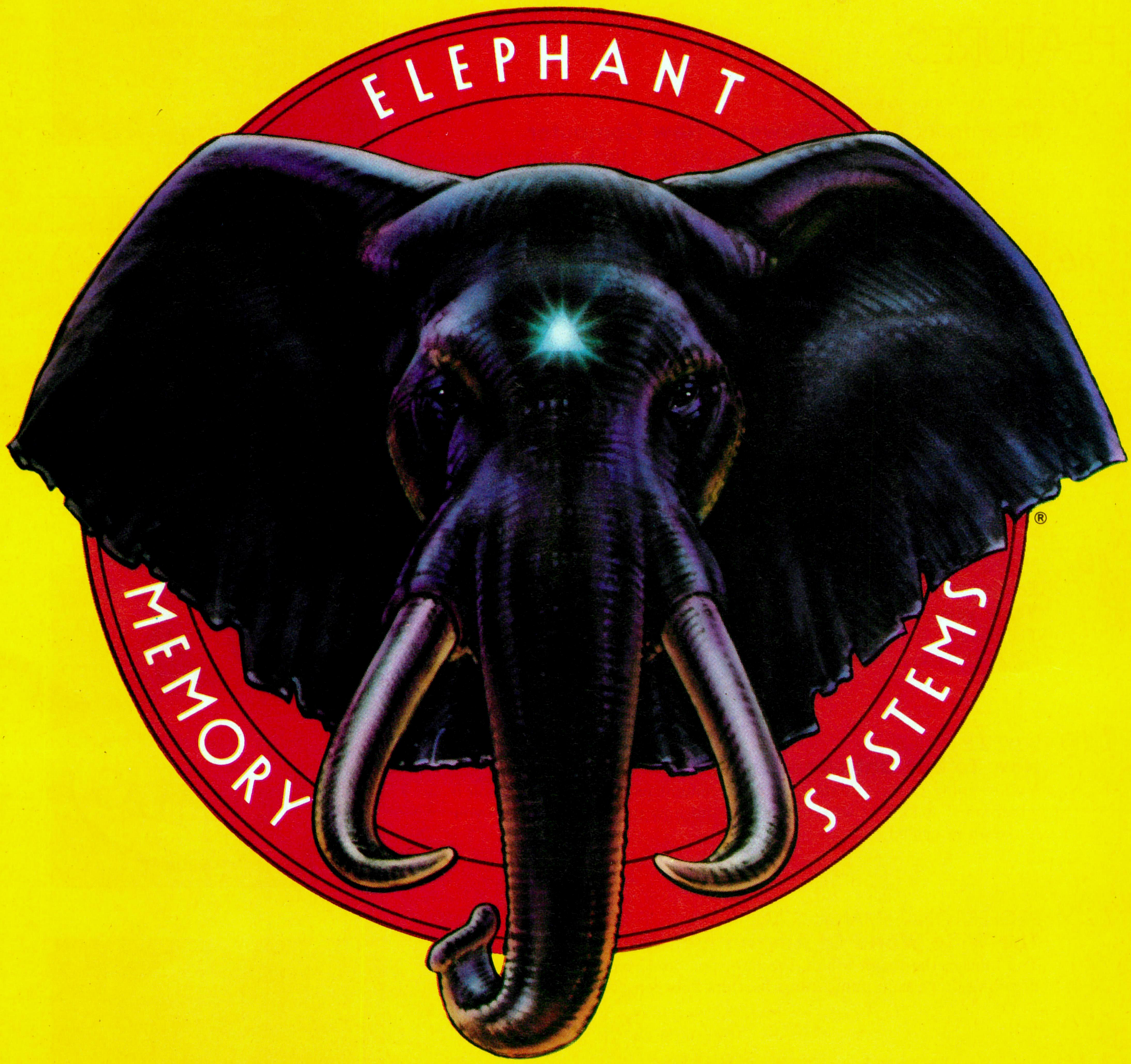

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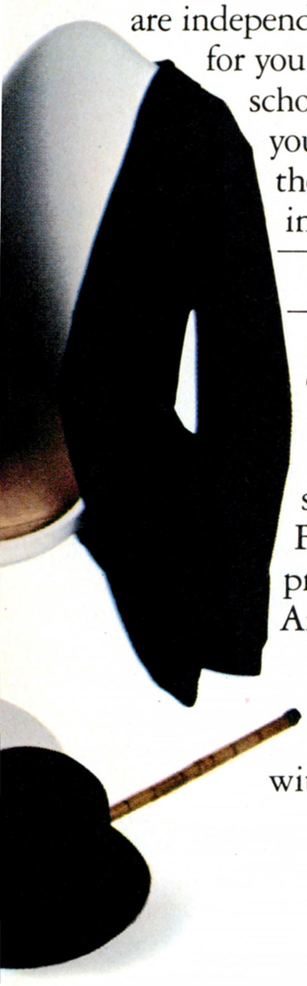

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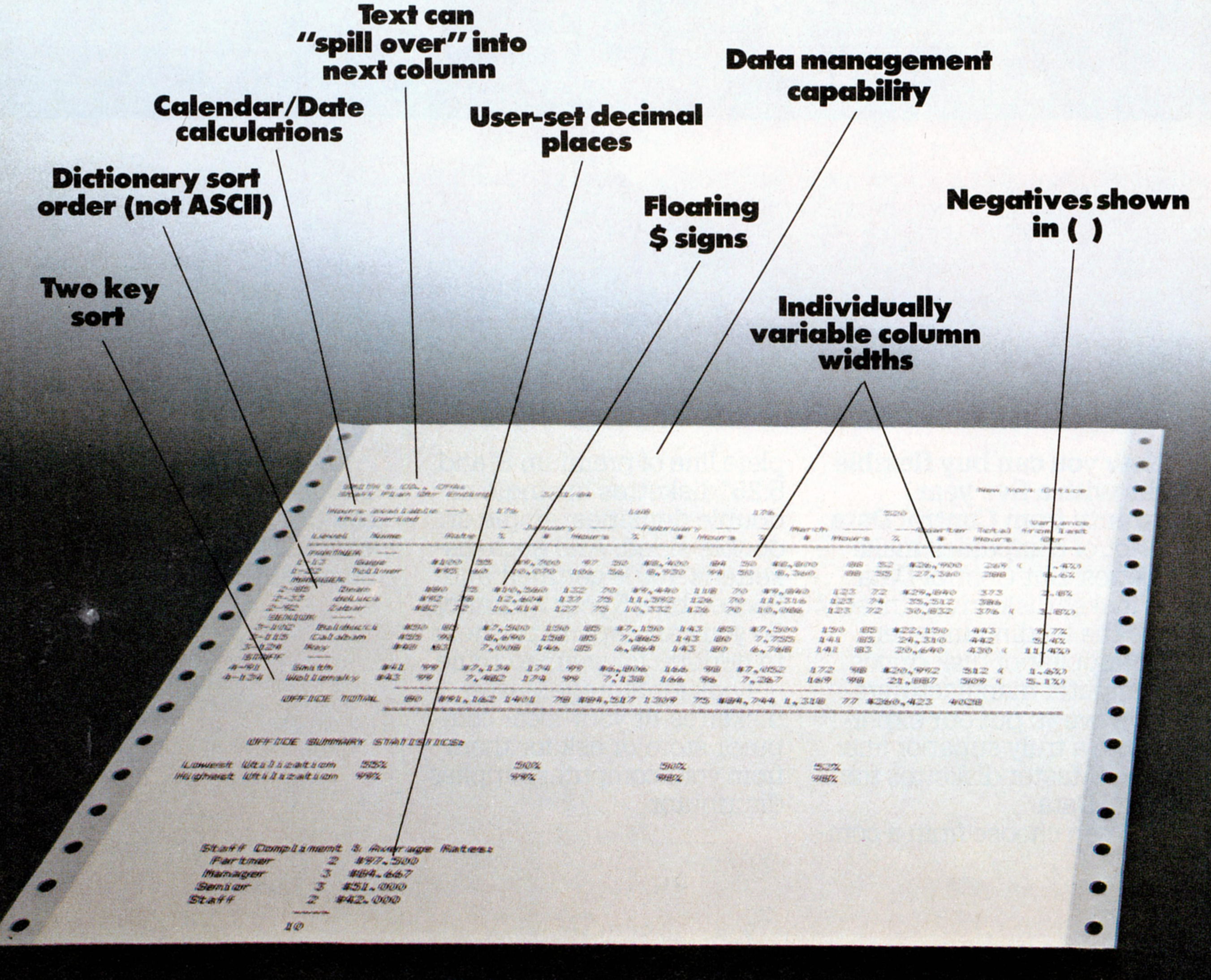
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     Hours available this --->     176            168            176            520
     this period
                              --- January ----  -February ----  --- March ----  ---Quarter Total   Variance
     Level    Name      Rate   %    #    Hours   %    #    Hours   %    #   Hours   %    #    Hours  from Last
                                                                                                       Qtr
     PARTNER ---
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     1-22     Pollinger  $95  60  10,070  106  56   8,930   94  50   8,360   88  55  27,360  288     6.6%
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              ---------------------------------------------------------------------------------------
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     OFFICE SUMMARY STATISTICS:

     Lowest Utilization    55%            50%            50%            52%
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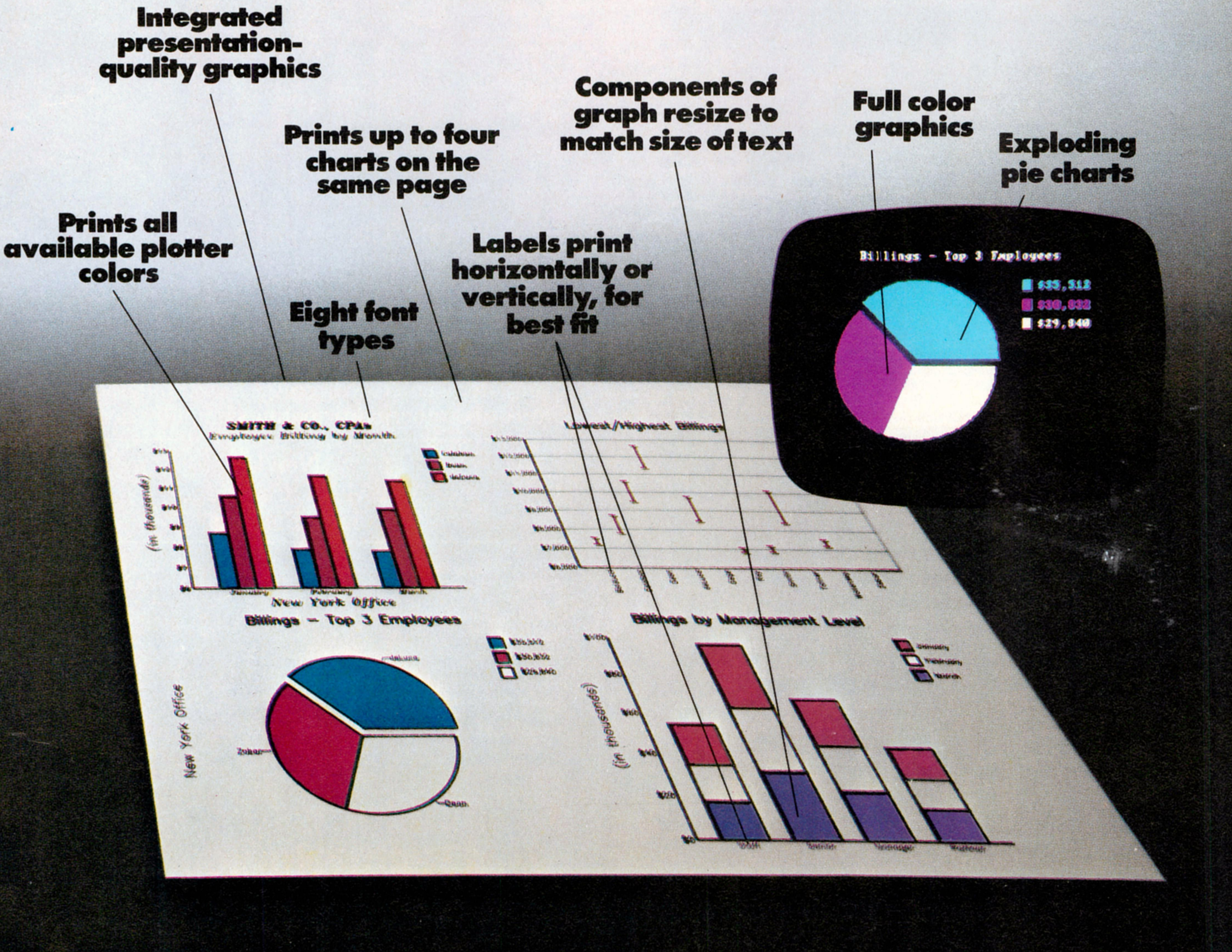
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The Customer Knows Best

"We pride ourselves on meeting the customer's needs." That's a slogan most companies would like to think applies to them. But how often does a company actually reach out and ask its potential customers what their needs are? That's what Convergent Technologies, a personal-computer manufacturer in Sunnyvale, Calif., did when developing its recently released portable computer, the WorkSlate.

Before WorkSlate even existed, Convergent's staff organized groups of businesspeople in San Francisco, Chicago, and New York, and solicited their suggestions for what they'd want in a portable computer. They talked to individuals who worked at their own desks, at client offices, at offsite meetings, on the road, in hotels, and at home. Using Labor Bureau Statistics, they identified the most likely occupations of people who were "on the move"—small business owners, managers, executives, sales and service professionals, financial analysts, and consultants, to name a few—and they asked these people to help define what WorkSlate would become.

Photo by Ed Kashi/Gamma Liaison

WorkSlate marketing manager Karen Toland headed a team which incorporated customer input into the design of the product.

"A kind of traveling office," is what Wiley Caldwell, one of the user's group participants, says he envisioned for WorkSlate. Caldwell, executive vice-president of the W.W. Grainger Company, a wholesaler and manufacturer of electrical equipment and supplies, spends enough time on the road to make a portable computer a valuable extension of his workplace.

"I'm away from the office so much," he explains, "and much of the time I'm out is wasted. I see the WorkSlate as a tool that will let me use that time. When I'm out of town, I could use it to keep up with sales forecasting and long-range planning, to keep track of appointments and expenses, and for notes and dictation."

According to Karen Toland, marketing manager for WorkSlate, Convergent's staff talked to "hundreds of people" during the product's development. More important, they really listened to what the users had to say. Step by step, WorkSlate was evolving into the machine that businesspeople said they wanted.

Paul Hogan, general counsel at Mariani Financial Company, a real estate development and venture capital firm in Cupertino, Ca., was involved in the discussions for about a year, starting at the breadboard stage and ending with a fully developed WorkSlate. Hogan's input on his day-to-day business interactions helped shape some of the computer's financial applications.

"Frequently, in the course of negotiations for acquisitions," Hogan says, "certain changes (in buying terms) are proposed. By using WorkSlate, salespeople in real estate and securities can drastically reduce the time spent juggling numbers to

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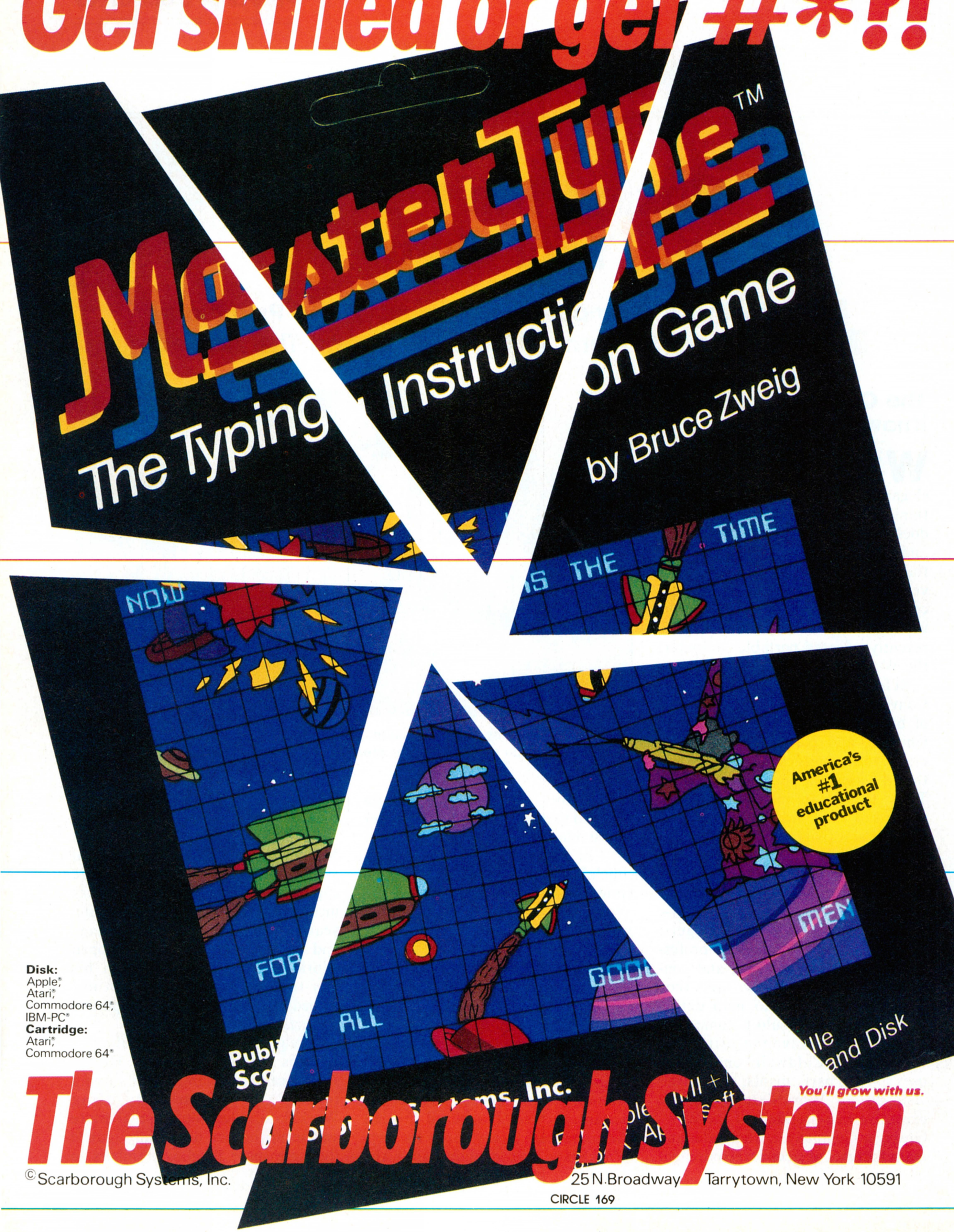
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create what-if situations. The worksheets that WorkSlate allows you to set up can show you immediately what effects, in terms of cost and benefits, a proposed change would have."

Going through a questionnaire with the developers and looking at the documentation were part of the process. But mostly, Hogan was asked to do just a lot of plain, old-fashioned jawing about his likes and dislikes.

"I liked the labeling of the keys," he says. "It was a good idea to use labels that are different from what you normally see. Convergent Technologies wanted keys that were somewhat self-explanatory because the product is probably being bought by different people from those who buy other computers."

Keys underwent rigorous revision, Toland says, some changing up to 20 times. "Every single word on the keys, and prompts and messages on screen were discussed with the users," Toland says. Convergent passed out lists of words and asked users to state which one most intuitively described a function. Rather than a key labeled "execute," for example, WorkSlate users supported the more basic "do it."

Virtually all of WorkSlate's features were covered in the discussions. Was the color design pleasing? Should the numeric keyboard be the same as the numbers on a phone, or the same as on a 10-key adding machine? Did the keys feel good, where should the screen be, was it too big, too heavy? Did features work the way you'd think they would work if you didn't have instructions? These were the questions Convergent asked, and these were the questions Caldwell and Hogan and others like them answered.

"One of the things that kept me involved," Hogan says, "is that they made me feel as if my comments were going to make a difference. I really felt I was contributing something," he says.

Microcassettes, originally intended for only data storage, became the executive's medium for dictation, as Convergent added voice capabilities to the machine. Businesspeople had requested a pocket recorder to which they could dictate letters, and Convergent complied. "This class of users," Toland says, "does their word processing with their mouths. They don't type in their data themselves. Voice took on a lot of significance."

WorkSlate's built-in modem had originally been conceived as a data communications convenience for sending information from one computer to another. But in the course of the meetings, it came out that while the users found the application interesting, most weren't yet doing data communications. They simply wanted the ability to make telephone calls while on the road. So WorkSlate evolved a bit more.

A speaker phone was added, making the computer a complete telephone. Users simply talk into it, as one talks into a speaker phone on one's desk. WorkSlate was also equipped with auto-dial, which retains the user's most frequently called numbers, retrieving whenever necessary.

As an outgrowth of the voice capability, Convergent decided to add headphones and a hand-held microphone jack, which allow for more privacy in listening and speaking into WorkSlate. In answer to another request, the developers gave the computer the ability to function as a simple calculator, in addition to its spreadsheet capabilities.

The WorkSlate group aimed to develop a product that was "simple, yet sophisticated," according to Matt Sanders, general manager of the WorkSlate group. They strived for a computer that would meet the real needs of the average businessman, while at the same time not scaring him off.

"We wanted a tool that would bring the enormous power of microelectronic technology to bear on the problems of people in business in a way they can understand. A machine that our dads could use."

"The way this process works," says Toland, "is to first identify who is going to buy your product and then ask them what they would like to use it for. You must learn to think like your customers, identify what's important to them, and then ask questions, and more questions.

"People need products that are logical and intuitive," Toland says. "They do not understand why they should have to read 200-page manuals to get a job done. They expect the products (they buy) to be useful tools, and are often frustrated by their clumsy operation.

"Consumers wouldn't dream of putting up with this (clumsiness) with cars or appliances," she continues. "Why should they tolerate it with something that is expected to be infinitely more powerful?"

Will Computers Replace The Doctor's Couch?

I'm an M.D.," says Dr. Ronald Levy of Williamsville, N.Y. "I'm a Board-certified adult psychiatrist and a Board-certified child psychiatrist. I'm a clinical assistant professor of psychiatry and pediatrics at the State University of New York at Buffalo. I have a private practice. I wrote a best-selling psychiatry book called *The New Language of Psychiatry*. I guess what I'm trying to tell you is that I'm not a crackpot who's got a computer."

Levy's readiness to explain himself is understandable. He, along with Dr. Sidney Rosen of New York City, has combined computer programming with hypnotherapy, a practice that leaves him open to a potential onslaught of criticism. After all, for

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every one person who casts a suspicious eye toward computers and programming, there are hundreds who are skeptical of the practice of hypnotism.

Levy and Rosen are using four different hypnotherapy programs in their private practices to help patients stay in school, stop overeating, stop smoking, or gain confidence and motivation through relaxation. (A fifth program which combats the fear of flying is in the works). The programs were written on an upgraded Apple II that has the capability of an Apple II Plus, and will run on any Apple or, according to Levy, any "Apple generic" (Rosen uses a Franklin Ace).

The programs look deceptively simple: On each screen there is a section of text which can be up to a paragraph long. The patient advances the text at his own pace, using a game controller. Each program asks various questions, and patients' answers are either typed on the keyboard or chosen from a multiple-choice listing with the game controller. Although Levy says it's easier to hold a child's attention if a speech synthesizer is used, the doctors have had remarkable results with adult patients who simply read the program off the screen.

This reading method is somewhat revolutionary in the annals of hypnotherapy, because it has been a common belief that only the spoken word will have any hypnotic effect on a subject. "When I hypnotize somebody," says Rosen, "people will say to me, 'You're a wonderful hypnotist, there's something about your voice.' I know people who have terrible voices who are also good hypnotists. It's not the (sound of the) voice. We're trying to figure out what it is that really hypnotizes people, but we can eliminate the voice."

Basically, hypnotism allows a person to achieve a desire that is usually buried deep in the subconscious. People may not even be aware that they want to accomplish something, as was the case with Rosen's son and his girlfriend.

While visiting Rosen during the 1982 Christmas holidays, the two young people decided to boot up the no smoking program and have a laugh. "They sat down and laughed all the way through the program," says Levy. But the two doctors had the last laugh. "She had been a chain smoker, but she stopped about four days after she got back to college. She hasn't smoked since last January. And that was from watching the program only one time." But, as Dr. Levy says, "A person can't be hypnotized into doing something he is really dead-set against doing."

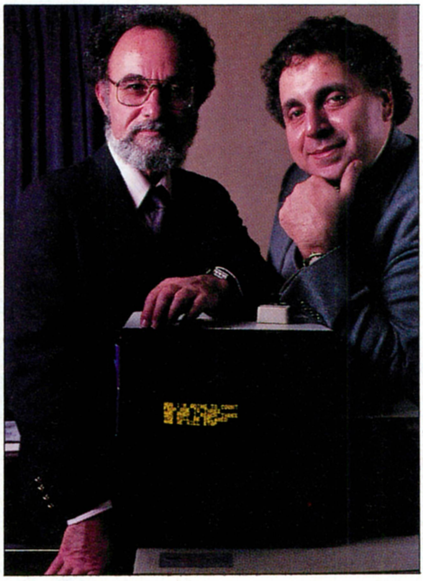
Photo by Andrew Popper

The combination of computer and hypnotherapy has proved successful for psychiatrists Rosen (left) and Levy.

Each program provides an almost personal touch because it queries patients on their specific situations. For example, the stay in school program asks questions about the patient's whole situation, and then modifies its responses to fit the profile given by the patient. For example, "If a person is in trouble with a school official, that is the person the patient has to deal with," says Levy. "(The program) actually takes you through it. If you're having trouble with Dean Smith, the program will say, 'Now you are able to go into Dean Smith's office and really convince him that you have made up your mind . . . to approach your education from a different point of view.' (The program) really works with the person . . . (so he is) able to carry that off."

All four programs have proven effective, but sometimes their most interesting facet is not the fact that they work, but how they work. "In the overeating program," says Levy, "there is one point in particular where it says, 'You will eat half of what you normally expect to eat, and you'll be pleasantly surprised to get up from the table and notice that you are full . . . and have eaten only half of what you expected to eat.' What that led to was many, many people calling me up and telling me, 'You know what's happening to me? Since I watched that program I stopped overeating. What I've been doing is actually eating half of everything. I'm eating half my sandwich, I'm eating half my doughnut, I'm drinking half my coffee—exactly half. And I don't even realize that I'm full until I'm up from the table, so I don't have to eat the rest (of my food).' The post-hypnotic suggestion was taken in a very literal way."

Of course, sometimes the programs are a little too effective. "Once we took (a program) on a local cable television show, and we were on for half an hour," says Levy. "We had the Apple hooked up to a speech synthesizer so the viewers would hear it as well as see it. We were going to start with five minutes of the CEPEC (relaxation) program to illustrate to the viewing audience what it was doing. The cameraman and the studio engineers all went into a trance so they didn't take the cameras off the computer for a long time. Fifteen

(continued on page 21)

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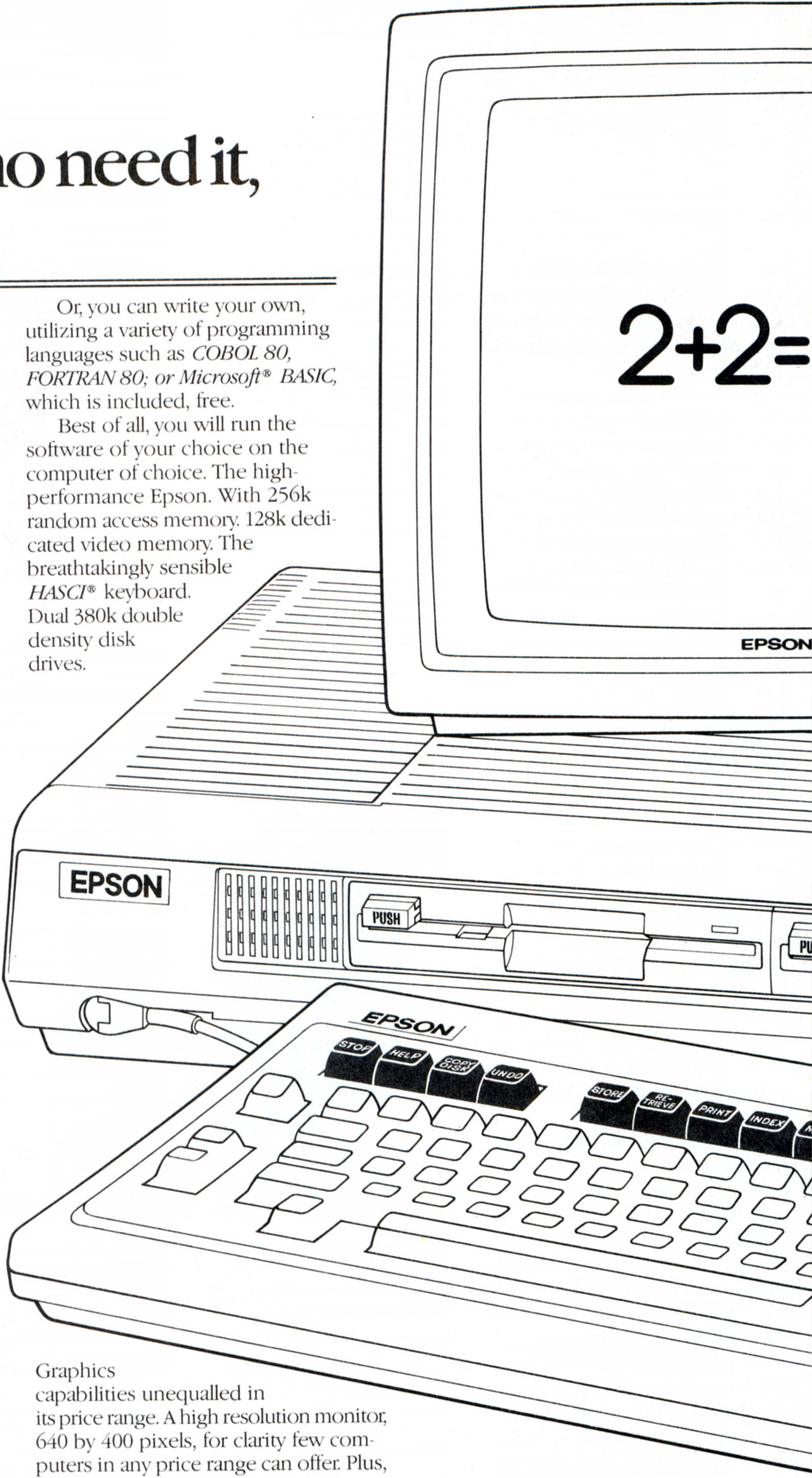

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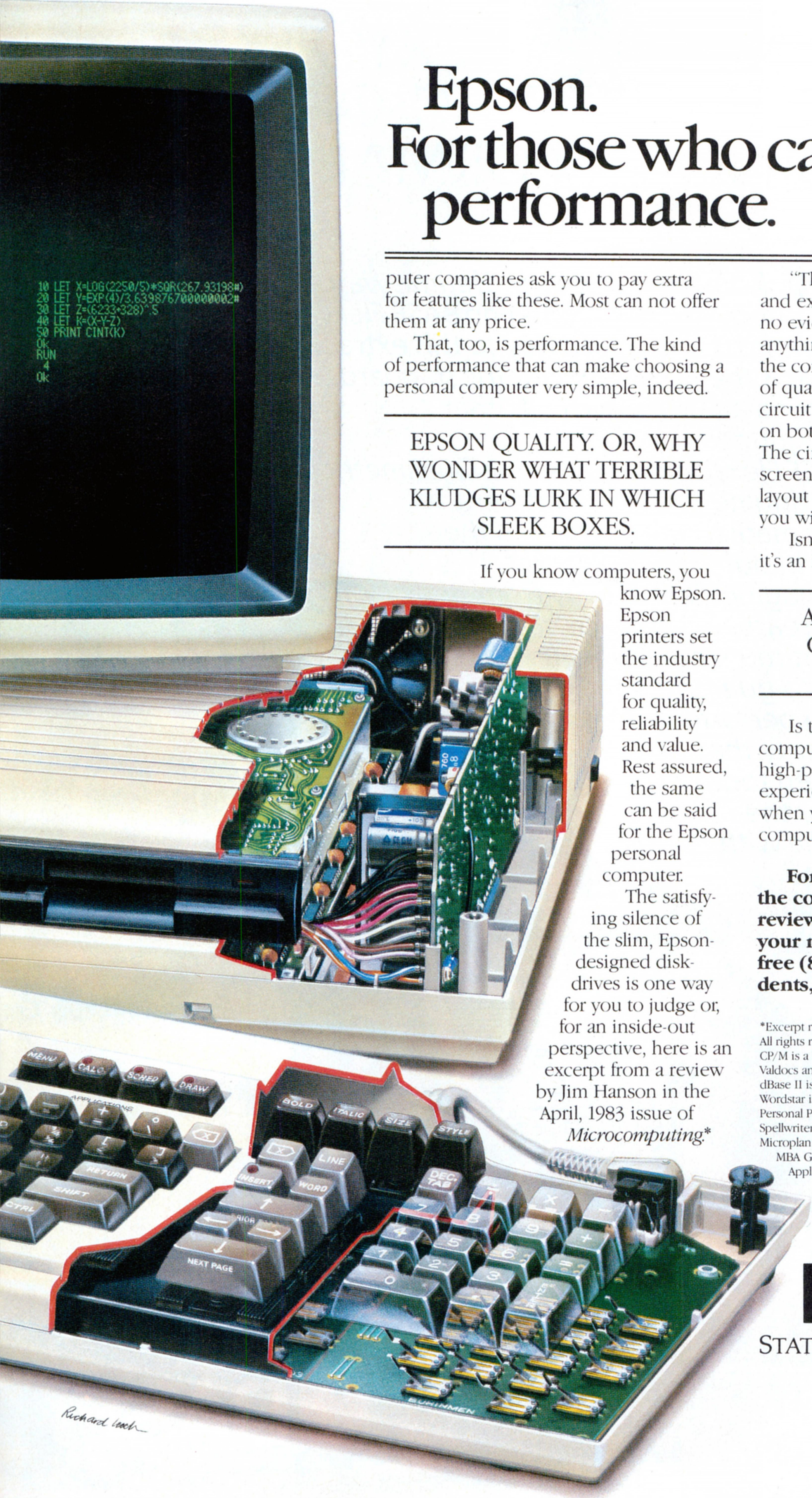

```
10 LET X=LOG(2250/5)*SQR(267.93198#)
20 LET Y=EXP(4)/3.63987670000002#
30 LET Z=(6233+328)^.5
40 LET K=(X-Y-Z)
50 PRINT CINT(K)
Ok
RUN
 4
Ok
```

puter companies ask you to pay extra for features like these. Most can not offer them at any price.

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The satisfying silence of the slim, Epson-designed disk-drives is one way for you to judge or, for an inside-out perspective, here is an excerpt from a review by Jim Hanson in the April, 1983 issue of *Microcomputing*.*

"The Epson QX-10 is soundly designed and executed. I looked hard and found no evidence of kludging or shorting out anything in the name of economy. All the connectors have gold on them and are of quality manufacture. The printed circuit boards are heavy, with soldermarks on both sides of double-sided boards. The circuit boards are completely silk-screened with component labels, and the layout is as professional and clean as you will find anywhere."

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For technical specifications, and the complete, 3-part *Microcomputing* review, along with the name of your nearby Epson dealer, call toll-free (800) 421-5426. California residents, call (213) 539-9140.

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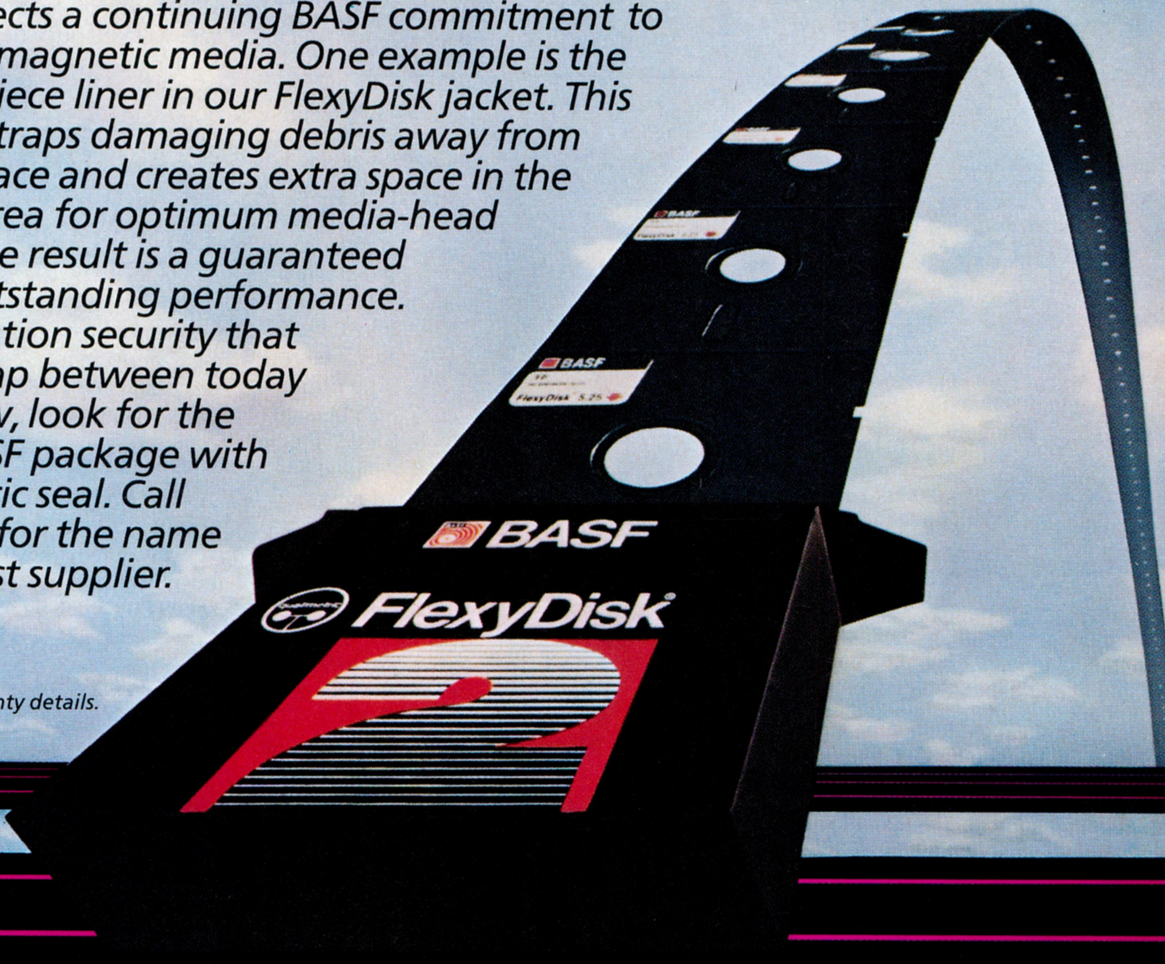

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(continued from page 17)

minutes into the show they were still focused on the computer. The talk show host was trying to signal them without making noise—waving her arms, everything—to get the camera off the computer.

"We did another television show in Cleveland where the director knew about this. He called all his people together and told them, 'This is a computer program which hypnotizes people. I want you to keep looking at one another and concentrate on what you're doing so you don't get hypnotized.'"

Levy and Rosen hope to market the software commercially someday, but they have no definite plans. "We only use the programs in situations where we've had the opportunity to be very close to the patient and where we can supervise," says Levy. Adds Rosen: "We're not ready to release them for the public yet. It may be that we'll produce a modified program, but for now we're using the software only with professional supervision."

—*Susan Jelcich*

Premium Insurance For Your Computing Properties

To what lengths will people go to protect their personal computers? Consider these examples. One couple chains their computer to their brass bed when they leave the apartment. Another computer owner keeps his system in a room with the doorknob rigged to give an electric shock to any intruders. A third owner has planted a radio-signal beeper in his processor so he can track the computer if it's stolen. And then there's the Brooklyn couple who live in a renovated warehouse and guard their Apple II and other possessions by stocking an indoor pool with alligators.

What do these people have in common—besides possibly overly active imaginations? Well, beyond their rather elaborate anti-theft systems, they have all acquired a more traditional form of property protection: insurance. They've been able to do so because of a new line of insurance called Safeware, developed exclusively for personal computers.

Designed primarily for the computer owner who uses his system for business, either in his home or at the office, Safeware is the brainchild of former computer accounting executive David Johnston. Johnston says he came up with the idea after purchasing an Atari 800 for his home.

"I got it for the games. I thought the graphics were great," he recalls. "But once I had it I was using it heavily for my business. I started organizing my business around it. Because it's not an expensive machine, I wouldn't have worried about it if I hadn't built up the system and come to rely on it."

Johnston then discovered that, because he was using his computer as part of his job as director of quality assurance for computer audits, his system was no longer covered by his homeowner's insurance policy. After making a few phone calls he also discovered that his dilemma was not unique.

"Most standard homeowners' policies don't cover computers used in business," Johnston explains. "Yet many people who've purchased microcomputers for fun are now using them for business, as well. They usually don't realize this could leave their $4000 or $5000 system completely unprotected."

Johnston's Safeware policy is designed to be the first comprehensive insurance policy for computers, regardless of the machine's use. Safeware covers all components of a computer system, including disk drives, modems, and software. It covers a wide range of threats to hardware and software, including fire, theft, accidental damage, and even power surges—the second greatest cause of loss, according to Johnston. About the only things it doesn't cover, he says, are losses resulting from computers left in unattended cars and those destroyed by nuclear war. Johnston quickly found his "market niche" beginning to take off.

Photo by T. Simon/Gamma Liaison

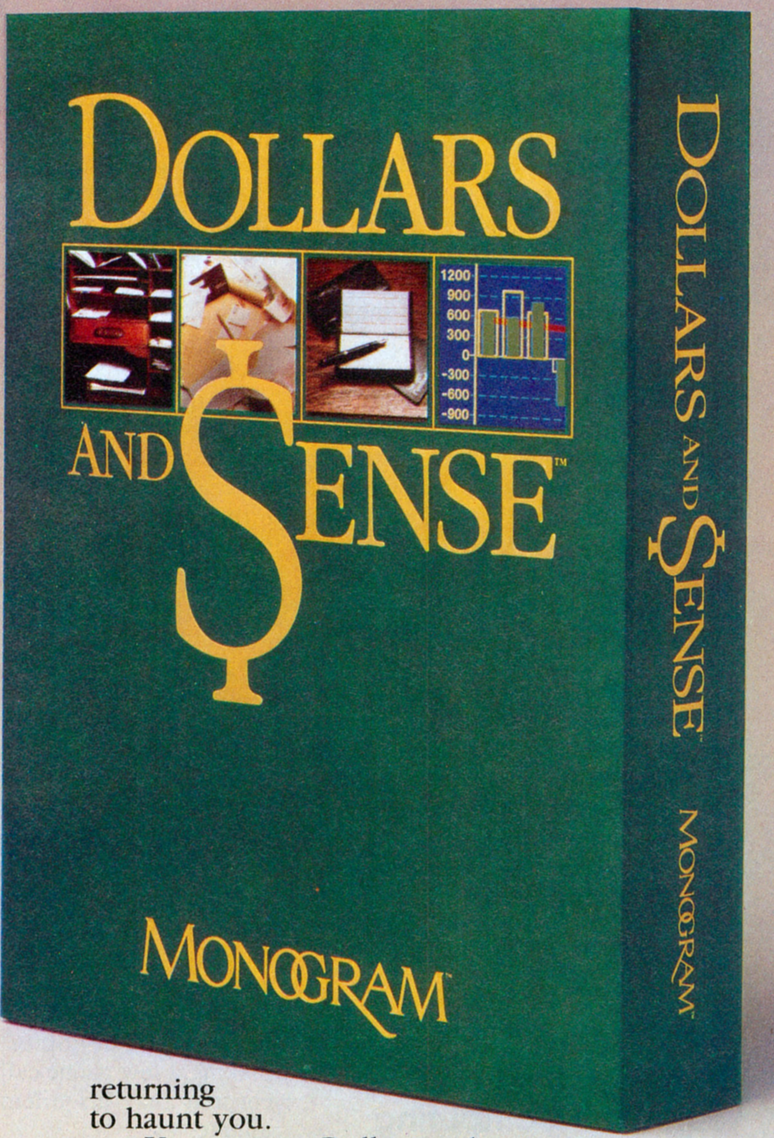
Safeware's David Johnston feels his company's insurance coverage offers peace of mind to personal computer owners.

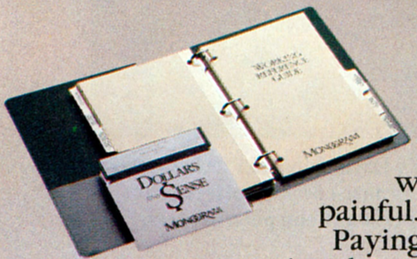
"We started marketing (the insurance) and it got to be very successful," he says. "At that point, after I saw the response, I found it was more important than what I was doing and I should pursue it. It's really very typical of what's happening to many people with microcomputers—they'll get involved with micros for one reason or another and just get caught up in the growth of the industry."

Safeware is now a full-time business for Johnston. His insurance policy, which is underwritten by the Fireman's Fund Insurance Company, differs from most other forms of insurance coverage in that it does not cover individual computer items. In-

(continued on page 27)

LESS TAXING.





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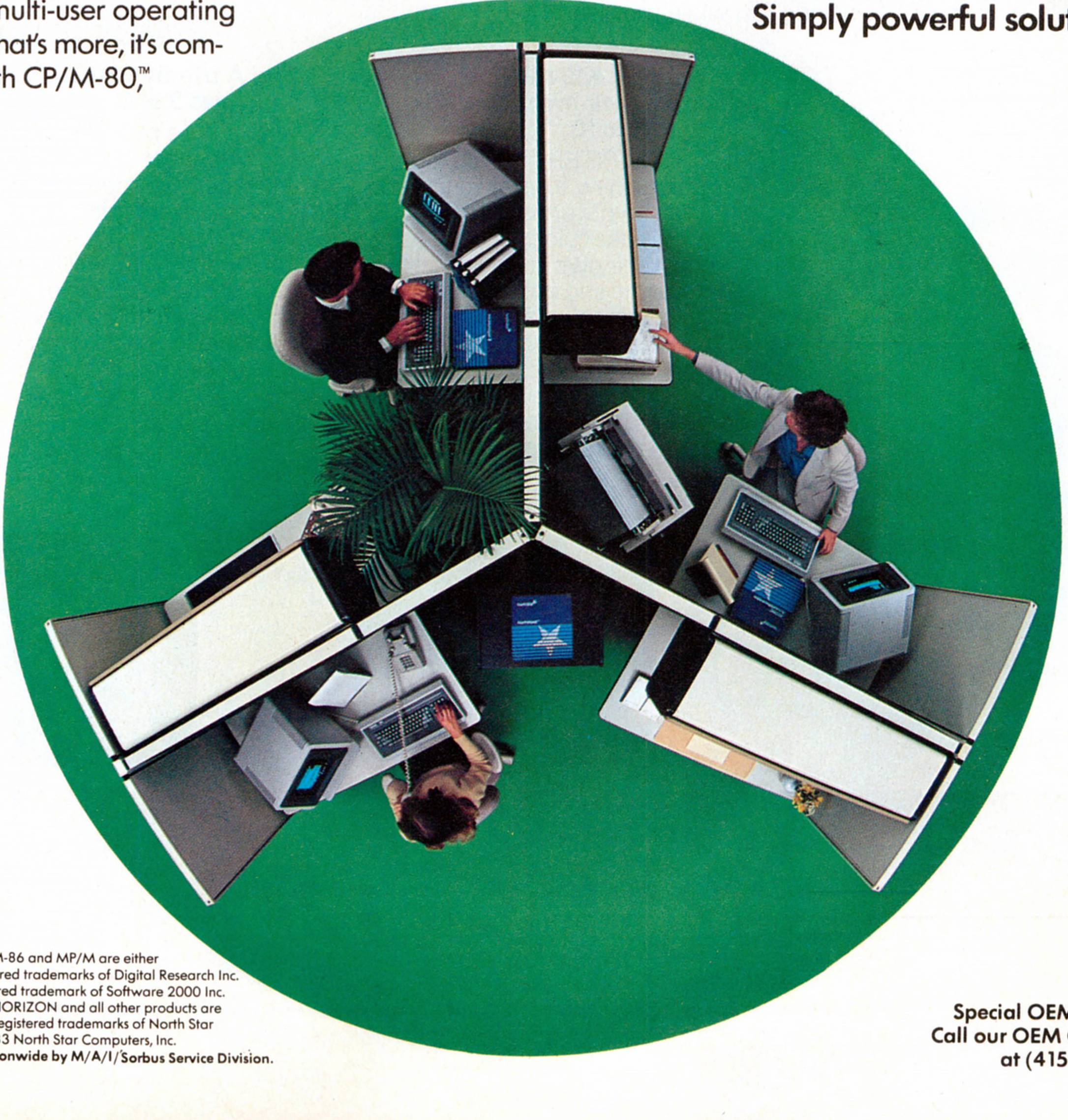

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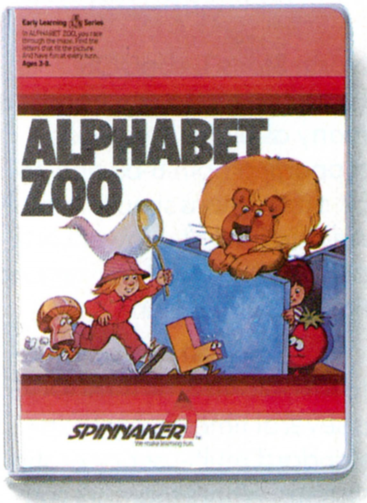
After all, if your kids are actually enjoying a learning game, there must be something to it. And there is: Fun, excitement and real educational value. That's what sets Spinnaker games apart from all the rest. And what brings parents back for more.

We offer a wide range of learning games for a wide range of age groups: 3 to 14. One look at these two pages will show you how we carefully designed our line of learning games to grow right along with your child.

So if you're looking for a line of learning games that are as much fun to play as they are to buy, consider Spinnaker Games. They're compatible with **Apple, Atari, IBM PC, PCjr, Commodore 64, Coleco Adam** and parents who don't mind their kids having fun while they learn.


Early Learning Series
ALPHABET ZOO
SPINNAKER
We make learning fun.

Early Learning Series
Make your own pictures then write a story to match. There are hundreds of ways to create your own special story book!
Ages 6-12.
KIDWRITER
SPINNAKER
We make learning fun.

It's new! KIDWRITER™ lets kids make their own storybook. Ages 6 to 10.

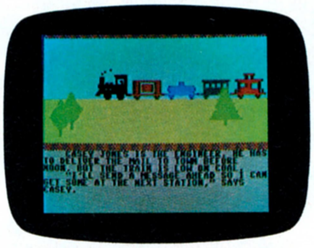
KIDWRITER gives children a unique new format for creating their own stories. With KIDWRITER, kids make colorful scenes, then add their own story lines. It's as versatile and exciting as your child's imagination!

Best of all, while it encourages children to create word and picture stories, it also introduces them to the fundamentals of word processing. KIDWRITER will bring out the storyteller in your children—and in you!

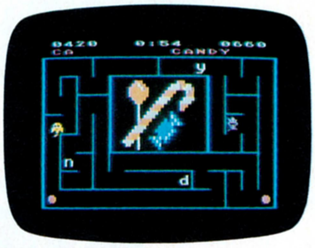
A trip through ALPHABET ZOO.™ Ages 3 to 8.

It's a race. It's a chase. It's Alphabet Zoo, a game that sends your kids zipping through the maze, after letters that fit the picture on the screen.

Your kids will have fun learning the relationship of letters and sounds, and sharpening their spelling skills. They'll be laughing at every turn.



```
     CASEY JONES IS THE ENGINEER. HE HAS
TO DELIVER THE MAIL TO TOWN BEFORE
NOON, BUT THE TRAIN IS LOW ON COAL.
     "I'LL SEND A MESSAGE AHEAD SO I CAN
GET SOME AT THE NEXT STATION," SAYS
CASEY.
```


0420
0:54
0660
CA
CANDY
y
n
d

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PARENTS, YOU WON'T SPINNAKER GAME.

FRACTION FEVER
SPINNAKER

DELTA DRAWING
SPINNAKER

FACEMAKER
SPINNAKER

FRACTION FEVER™ brings fractions into play.
Ages 7 to Adult.

FRACTION FEVER is a fast-paced arcade game that challenges a child's understanding of fractions. As kids race across the screen in search of the assigned fraction, they're actually learning what a fraction is and about relationships between fractions.

All in all, FRACTION FEVER encourages kids to learn as much as they can about fractions—just for the fun of it!

DELTA DRAWING.™ Have fun creating pictures and computer programs.
Ages 4 to Adult.

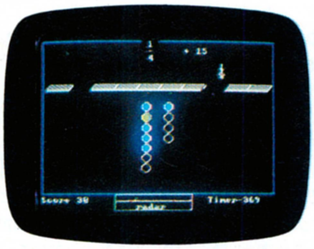
Kids love to draw. And DELTA DRAWING Learning Program lets them enjoy creative drawing and coloring while they learn computer programming concepts.

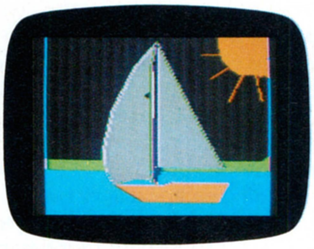
With DELTA DRAWING, even kids who have never used a computer before can learn to write programs and build an understanding of procedural thinking. It's easy, clear, and lots of fun!

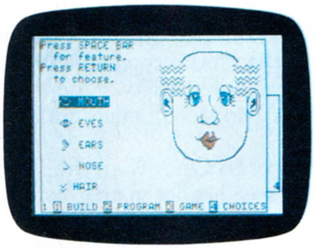
FACEMAKER™ makes faces fun.
Ages 3 to 8.

FACEMAKER lets children create their own funny faces on the screen, then make them do all kinds of neat things: wink, smile, wiggle their ears, and more.

Plus, FACEMAKER helps familiarize children with such computer fundamentals as menus, cursors, simple programs, and graphics. FACEMAKER won't make parents frown because their children will have fun making friends with the computer.





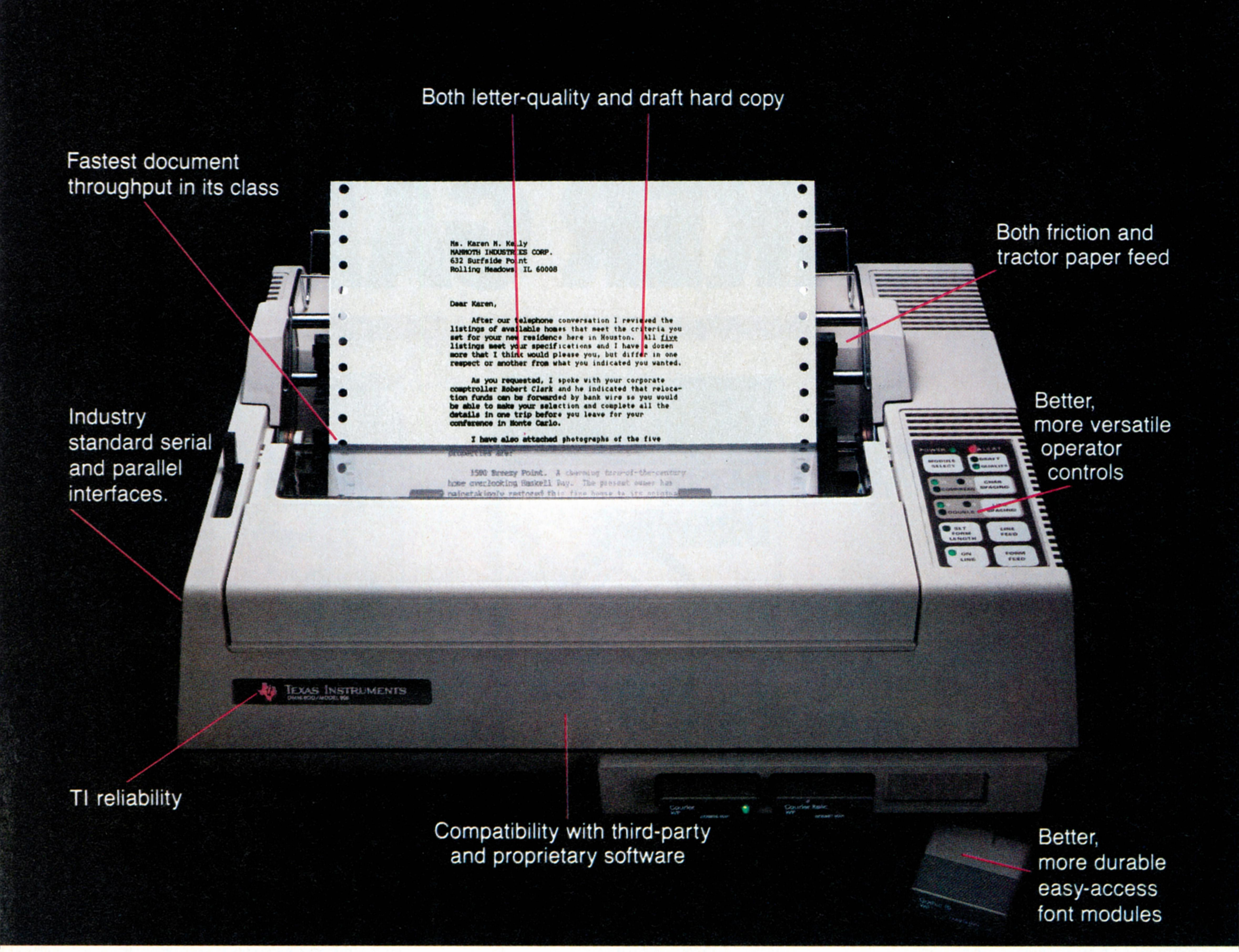


Press SPACE BAR
for feature.
Press RETURN
to choose.

SPINNAKER™
We make learning fun.

Disks for: Apple, Atari, IBM PC and PCjr, Commodore 64.
Cartridges for: Atari, IBM PCjr, Commodore 64, Coleco Adam.

CIRCLE 161


Both letter-quality and draft hard copy
Fastest document throughput in its class
Both friction and tractor paper feed
Better, more versatile operator controls
Industry standard serial and parallel interfaces.
TEXAS INSTRUMENTS
TI reliability
Compatibility with third-party and proprietary software
Better, more durable easy-access font modules

Ms. Karen M. Kelly
MAMMOTH INDUSTRIES CORP.
632 Surfside Point
Rolling Meadows, IL 60008

Dear Karen,

After our telephone conversation I reviewed the listings of available homes that meet the criteria you set for your new residence here in Houston. All five listings meet your specifications and I have a dozen more that I think would please you, but differ in one respect or another from what you indicated you wanted.

As you requested, I spoke with your corporate comptroller Robert Clark and he indicated that relocation funds can be forwarded by bank wire so you would be able to make your selection and complete all the details in one trip before you leave for your conference in Monte Carlo.

I have also attached photographs of the five properties are:

1580 Breezy Point. A charming turn-of-the-century home overlooking Haskell Bay. The present owner has

Introducing the TI 855 microprinter. No other printer says better so many ways.

Feature for feature, no other microprinter can match the versatility, compatibility, reliability and productivity of the OMNI 800* Model 855 microprinter. Here's why.

Two Printers In One. With the TI 855 you get the speed of dot matrix draft copy. Plus the precise clarity of the most advanced matrix technology for letter-quality print. It's two printers in one — at one low price.

A Great Family Name. Texas Instruments is known for providing the world with the industry standard for printers — the TI 810. TI builds the same reliability into every 800 series microprinter. Both the 855 and the data processing Model 850 are part of the expanding TI line of high-performance, low-cost microprinters.

Hardware Compatible. The TI 855 microprinter is compatible with all major PC hardware. And it provides both serial RS232C subset and "Centronics-type" parallel as standard interfaces.

Software Compatible. The TI 855 uses industry standard escape sequences for compatibility with virtually all third-party software. And for those with proprietary software needs, a model is available with ANSI standard escape sequences.

Tough Font Modules For Quick Character Change. Three font modules can be inserted into the front of the printer at one time, and are accessed individually. Each contains both draft- and letter-quality character sets. They're easier to use, more reliable and more durable than traditional metal or plastic daisy wheels.

More Productivity Than Any Other Microprinter. The 855 offers both friction and tractor paper feed, to handle all types of word and data processing applications. A quick-change snap-in cartridge ribbon. Raster and mosaic graphics. And intelligent printing which maximizes document throughput — regardless of format.

Get the printer that makes for better information systems. For more information visit your nearest TI authorized dealer or write Texas Instruments Incorporated, P.O. Box 402430, Dept. DPF-082PS, Dallas, TX 75240. Or call toll-free: 1-800-527-3500.

TEXAS INSTRUMENTS
Creating useful products and services for you.

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291380-R1

(continued from page 21)

stead, Safeware lets the client choose a total coverage amount, say $5000, and the client will be completely insured against loss for any hardware or software he purchases up to that amount. The annual premium for a typical system consisting of a $3000 computer, $1100 printer, and $900 worth of software, for example, would cost $60, with a $50 deductible. Coverage up to $2000 runs only $35. Safeware reimburses the insured computer owner for the full replacement cost of the equipment at the time of the loss.

Johnston attributes his successful entry into the crowded insurance market to the failure of his competitors to see the need for specialized coverage of personal computers. "I think the insurance industry was thinking that there were other ways to cover (computers) and so they didn't see any demand," says Johnston. "But . . . the appropriate coverage wasn't readily available and we made it so easy. We cover the computer specifically, and you're . . . covered up to a total amount. That's what people want out of computer insurance."

Insurance companies have found it difficult to offer home computer coverage, he claims, because many of their existing policies either aren't designed to cover such items or simply cover items on an individual basis. These "floaters" are written with rates based on the value of the individual items covered, like a disk drive or a printer. This "scheduling" method of rating has major drawbacks for computer owners who continually change or upgrade their systems, explains Johnston, since the owner would have to update his policy every time a piece of equipment was added or deleted from his system.

"What people were telling us when they found out about us was they'd ask their agent (about personal-computer insurance), and he'd never respond because he just didn't have a product that was really designed to cover computers," he says. "There are other ways you can insure your computer, and I think if you called 10 different agents you'd get 10 different responses. But we're certainly the only ones who are marketing a product specifically designed for this type of computer."

Because the Safeware policy insures an owner up to a total amount, policies are quoted and issued over the phone, according to Johnston. Policies are written for both home users and businesses.

How good is Safeware coverage? One couple who were moving out west found out in a rather bizarre way, says Johnston. Their pet cat, apparently upset by the relocation, managed to relieve himself on a box filled with software. Their $200 claim was approved with no questions asked.

More information about Safeware insurance can be obtained by calling the company at (800) 848-3469.

The Racer's Edge

When you sit back and watch the U.S. Ski Team compete in the Winter Olympics this month in Sarajevo, Yugoslavia, take a moment to consider all the arrangements and preparations that go into every race. There are training, scheduling, financial, dieting, and psychological factors behind each and every performance. Mountains of information have to be digested by the team's administrators before the skiers can tackle the snowy slopes.

The Ski Team is getting help in plowing through those paper mountains, and in developing more effective training programs, through the use of computers. As part of its six-year sponsorship of the U.S. Ski Team, Texas Instruments, Inc., has donated 11 of its new TI Portable Professional Computers, 17 TI Professional desktop models, 30 TI-99/4A home computers, a Business System 680A minicomputer, and five portable 703 terminals to the team to help them train for the gold.

There are three basic ways the computers help the team: administration of business matters, development of training and sports medicine programs, and for athlete's education and entertainment.

Inez Aimee, executive director of the U.S. Ski Team and the U.S. Educational Foundation (a fund-raising arm that helps to support the education and morale of the athletes) says, "These computers will truly revolutionize our whole organization, it's the most dynamic change for us in years."

Explaining that many bookkeeping, scheduling, and other time-consuming chores were previously done by hand for the team's 200 athletes and staff members, Aimee says the computers help the Ski Team save time and achieve better results. "The computers help us receive critical information faster."

The minicomputer is housed in the team's headquarters in Park City, Utah, handling day-to-day operations such as accounting and scheduling, and maintaining data bases such as medical histories, tabulations of race results, past training schedules, and traveling schedule information for use by team doctors, coaches, trainers, and administrators. These data bases can be accessed by the personal and portable models as well as by the remote terminals. TI has also provided the team with interfaces that will let them access an IBM mainframe at the U.S. Olympic Center in Colorado Springs, Colo., from their remote terminals.

With access to the Olympic committee's mainframe, the Ski Team is able to work with athlete information from the mainframe's data base, expanding the data available for developing future training programs.

Coaches are using the Professional models to help them develop training

For the 21st Century Mind

Do you wish you could play with something as intelligent as your word processor?

Did you outgrow monsters years ago?

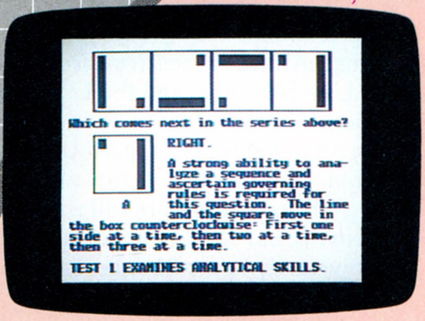
Is your home accounting program too dull to play?

Are spreadsheets not your idea of a good time?

Introducing Millennium software. Literate. Engrossing. Enriching. And Playful.

It will stretch your mind all the way to the 21st century.

The Brain Game



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Which comes next in the series above?

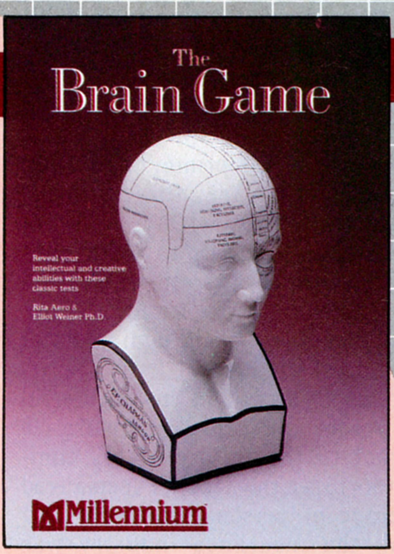
            RIGHT.

            A strong ability to ana-
            lyze a sequence and
            ascertain governing
            rules is required for
      A     this question.  The line
            and the square move in
the box counterclockwise: First one
side at a time, then two at a time,
then three at a time.

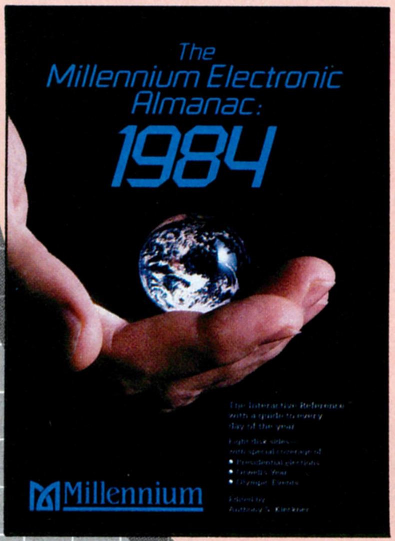
TEST 1 EXAMINES ANALYTICAL SKILLS.
```

Test your right brain, your left brain, your hardware and software, and discover how you measure in intelligence and creativity. With these classic tests find out how smart your computer thinks you are...and get smarter while you do it.

Explained by Rita Aero and Elliot Weiner, Ph.D. $39.95.


The
Brain Game
Reveal your intellectual and creative abilities with these classic tests
Rita Aero & Elliot Weiner Ph.D.
Millennium

The Millennium Electronic Almanac:™ 1984



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Famous birthdays
Notable quotes
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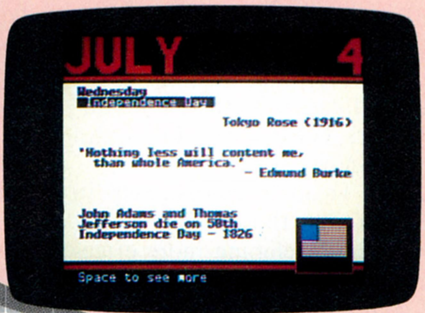

```
JULY                       4
Wednesday
 Independence Day
                  Tokyo Rose (1916)

'Nothing less will content me,
  than whole America.'
                  - Edmund Burke

John Adams and Thomas
Jefferson die on 50th
Independence Day - 1826

Space to see more
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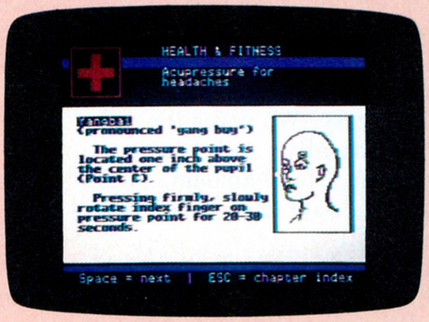

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          HEALTH & FITNESS
          Acupressure for
          headaches

Yangbai
(pronounced 'yang buy')

  The pressure point is
located one inch above
the center of the pupil
(Point C).

  Pressing firmly, slowly
rotate index finger on
pressure point for 20-30
seconds.

Space = next  |  ESC = chapter index
```

InfoDisks,™ an information bank including:

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Ask for these Millennium products at your local dealer.

CIRCLE 195

programs. These programs can become extremely specialized—there are a total of six racing formats for both men and women skiers, making a total of 12 different types of events, each requiring different training techniques and schedules. These formats include slalom, giant slalom, and downhill (called "alpine" events), plus cross country, jumping, and a combination of these two events (categorized as "nordic"). Coaches will also be tracking the development history of the team to help in future training programs.

"Our objective is to track our athletes using a physical, psychological, and geographic location profile," says Aimee. "That way we may get an idea of what kind of athlete will rise to a world-class level."

Use of the computers is also helping in the development of the team's sports medicine program. In Aimee's opinion, "Sports medicine is one of the most interesting endeavors people are pursuing in athletics. It's a science in which we are still learning how to evaluate the body and the mind in terms of their capacities."

Team psychologist Dr. Jerry May and orthopedist Dr. Richard Steadman work with athletes in the sports medicine program. For May, who is a clinical psychologist at the School of Medicine of the University of Nevada, the TI Professional Computer saves time in evaluating psychological factors affecting performance of the skiers. He has the athletes take psychological profile tests on the computer, and from there he can come up with scores to give feedback on how they are doing psychologically. "We're not using this for selection," May points out, "only to help us set up individualized psychological programs to optimize performance."

May has to consider many stress factors in devising a counseling approach for each athlete. Besides competing against the clock, other skiers, and teammates, skiers face the risk of injury. Ski Team members have also been uprooted from their homes, and must live with each other while training. "I try to help them develop better control of tension, better concentration, positive thinking, and better communication with other team members," he says.

Steadman uses his computer to help him track the muscle flexes and twitches of skiers recuperating from an injury. Aimee explains, "When you are trying to put bones together, you have to do a lot of picture and word study."

Steadman is also concerned with psychological reactions to broken bones, and he works with May to bring the whole athlete back, body and mind.

SUBARU
23
U.S.A.

Photo by Lori Adamski-Peek

Dan Simoneau has benefitted from the training and sports programs developed with the team's personal computers.

The computer also helps set up a proper training schedule and diet for each athlete. "By tracking reflex responses and other training measurements on the computer," says Aimee, "we can find ways to cut seconds off the racing times." The sports medicine program also guards against overtraining by tracking when skiers overuse muscles.

A study of diet can also be crucial to an athlete's performance, and with the use of the TI computers, the Ski Team can find out the proper carbohydrate, protein, and body fat levels for a racer in a given situation. From this information, foods are recommended that give a skier the nutritional balance to bring out the best performance in a race.

Aimee is excited about how computers will help develop the science of sports medicine for the Ski Team. "The objective of an elite athlete is to push the body to the limit, and through sports medicine we need to determine what that limit is.

All the training and traveling the skiers do during the year causes problems for these young people as far as their education is concerned. That's where the 99/4As help out. "The athletes use the 99/4As to augment their education while they're away from home," says Aimee, "because one of the major problems for an athlete committed to elite status in ski racing is that he or she has got to give up the opportunity for normal schooling."

Training for this elite status starts early. "A rising athlete starts on a race circuit at 13 or 14 years old, and trains or races 11 out of 12 months a year every single year," says Aimee. The 99/4A's educational software makes it easier for athletes to get the education they need. Also, since these young athletes hear many languages spoken in the different countries of Europe, the Ski Team uses a lot of language-teaching software.

Whether the Ski Team is victorious at Sarajevo or not, they'll certainly benefit from their use of computers. And the training and other advantages they'll receive should continue to pay off in the future. The Ski Team doesn't disband after the Olympics, but will almost immediately begin to point toward the next year's international competition, and the World Cup in 1986.

“Frankly, you couldn't pay me to use this software.”

— **Shirley Rogers,** Controller, Cybernetic Data Products, Inc.

Shirley Rogers takes her job as Controller for Cybernetic Data Products very seriously.

So when it came time for her to computerize her firm's accounting procedures, she studied every available software option thoroughly. And we're happy to report that she chose *Legend.*

Fact is, *we* know that *Legend* is the finest accounting software you can run on a microcomputer. Because it has the power and versatility of systems found in Big-8 accounting firms. Even still, we were more than a little curious what it was about the program that most attracted Shirley. So we asked her.

“Cybernetic Data Products is an extremely report-intensive company. So when I went shopping for software, my first criterion was a program that can generate reports—quickly and easily. *Legend* fit the bill perfectly because it allows me to define and create thousands of different types of reports, in detail or in summary form.

“Plus, since I was new to computers, I was after an accounting system that was easy to use and simple to operate. Most of the software I tried was reputed to be 'user-friendly.' In reality, they were impossible to figure out and cumbersome to operate. I had *Legend* up and running in minutes. My hat's off to the folks who wrote the instructions and made the program such a joy to use.

“When you've been doing accounting for years, the last thing you want is to have to learn a different way of doing things to accommodate the software. *Legend,* on the other hand, has adapted perfectly to *my* way of doing things.”

The System and its components. The *Legend* system consists of five programs in three modules: General Ledger, Accounts Receivable/Order Processing/Inventory Control, and Accounts Payable... and may be purchased as an entire system or individual modules. Some highlights:

General Ledger

- Maintains period and year-to-date account history.
- Prepares statements by department and cost center location.
- Generates summary and detailed statements.
- Provides fail-safe automatic audit trails.
- Prepares budget figures for account and period.

Accounts Receivable/Order Processing/Inventory Control

- Analyzes cash flow by net due date and discount date.
- Produces overdue listing in customer or representative sequence.
- Provides sales statistics with previous year comparison.
- Allows individual payment terms for each customer.
- Interfaces to General Ledger.
- Automatically flags items to be re-ordered.
- Reports product profitability by previous, current, and year-to-date.

Accounts Payable

- Allows payment selection by net date and discount date.
- Discount analysis to aid payment selection.
- Provides details of balance, order information, and exceptions. Interfaces to General Ledger. And much more.

Links to your software. As you can see, *Legend* is a complete and highly flexible system that was designed with the features recommended by CPA's. What makes it even more valuable is that, by adding an inexpensive linker, you can provide an interface to software you're already using... like WordStar, Lotus 1-2-3, dBase II, and even BASIC.

With all this going for it, it's no wonder that *Legend* is fast becoming the world's most popular accounting software. See it today at finer software dealers or write directly to Base Technology Corporation.

And we'd like to thank Shirley for lending her observations to this ad. Even still, she wanted to have the last word: “You couldn't pay me to use this or any other software. I don't believe in handing out endorsements lightly. But when I find a product that exceeds my expectations in every single respect, I would gladly pay twice the asking price. *Legend* is a bargain!”

Thanks, Shirley. We couldn't have said it better ourselves.

LEGEND™

Base Technology Corporation
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Lotus 1-2-3 TM of Lotus Development Corp. WordStar TM of MicroPro. dBase II TM of Ashton-Tate.

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CIRCLE 182

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You're traveling through 140° terrain at 300 rpm.

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maxell
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CIRCLE 110

Multifunction Products For Professionals

VisiOn **Compaq Plus** **Power-Base**
HP 7475A Plotter **Landlord**

VisiOn: WORTH THE WAIT

by Kevin Strehlo, Associate Editor

Nearly a year after its public announcement, the VisiOn operating environment has arrived, along with the first applications programs designed to work in it. Now, finally, this new kind of personal computing we've all heard so much about—the kind in which you can see and develop your ideas in words, tables, graphs, and planning sheets all at once in the multiple windows of a single screen—should be greatly enhanced.

The basis of VisiOn is best described by a metaphor: The computer screen becomes a desk top on which tasks can appear simultaneously as separate pieces of paper; information from any one of them can be electronically cut and pasted into another. The different tasks are made up with the the VisiSeries applications—VisiOn Word, VisiOn Calc, VisiOn Graph, and VisiOn Query—all pieces of a single, larger design.

VisiOn alone is essentially useless without the application packages that run in it. But its value becomes apparent when you realize that it enhances the power of each application. For example, says product manager Kurt Lynn, VisiOn Calc is more spreadsheet than most people will ever use because it runs in the larger VisiOn environment.

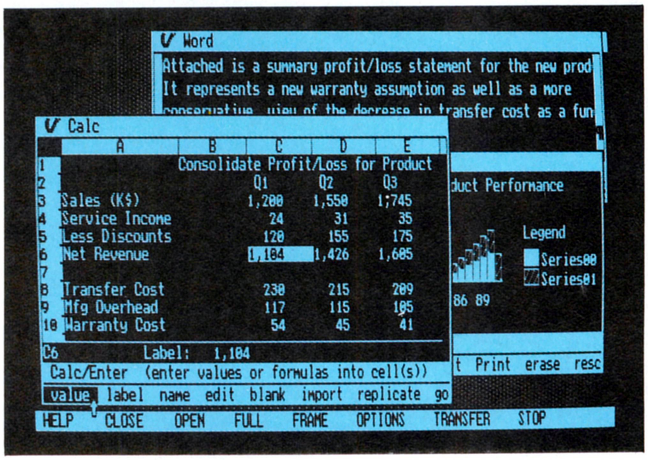
The eight basic commands shared by all VisiOn programs—Help, Close, Open, Full, Frame, Options, Transfer, and Stop—and the additional commands specific to each application were chosen to be self-explanatory, complementary, and consistent. The effect is like the standardization of airplanes:Once you know how to fly one, it's not that difficult to learn to fly another.

The device that VisiCorp uses to fly the user through the VisiOn environment is an optical mouse moved about on a gridded pad, which moves the cursor in a corresponding manner on the screen. Running VisiOn is simply a matter of pointing at the command you want to execute—or, less often, pointing at the window or window area you want to act on—and pushing the Select button.

Although pointing with the optical mouse seems slower and less precise than it does with the mechanical mice that still float around VisiCorp (it seems there weren't enough sighted mice to go around yet when we visited), it is still surprisingly quick and easy. And although many people who have been waiting patiently for VisiOn would have been pleased to see it emerge sooner, the performance tuning and quality assurance procedures that lengthened its gestation were effective. When you press Select on the mouse, VisiOn responds consistently and with satisfying alacrity.

Rolling the mouse

You begin with only the services window up on the screen, and use the mouse to move the cursor, which is shaped like an arrow or pointer, to the Start command at the bottom of the window. Pushing the left-hand Select button on the mouse causes the word Start to highlight (it changes to black on white while the other commands



```
Word
Attached is a summary profit/loss statement for the new prod
It represents a new warranty assumption as well as a more
conservative view of the decrease in transfer cost as a fun

Calc
      A              B        C        D        E
1                    Consolidate Profit/Loss for Product
2                             Q1       Q2       Q3
3  Sales (K$)              1,200    1,550    1;745
4  Service Income             24       31       35
5  Less Discounts            120      155      175
6  Net Revenue             1,104    1,426    1,605
7
8  Transfer Cost             230      215      209
9  Mfg Overhead              117      115      105
10 Warranty Cost              54       45       41
C6          Label:   1,104
 Calc/Enter  (enter values or formulas into cell(s))
```

duct Performance
Legend
Series00
Series01
86 89
t Print erase resc
value label name edit blank import replicate go
HELP CLOSE OPEN FULL FRAME OPTIONS TRANSFER STOP

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CIRCLE 37

remain white on black) and a prompt appears in the line directly above to explain that Start means "run a product in the window." Selecting Start brings a new prompt: "Select the product to start."

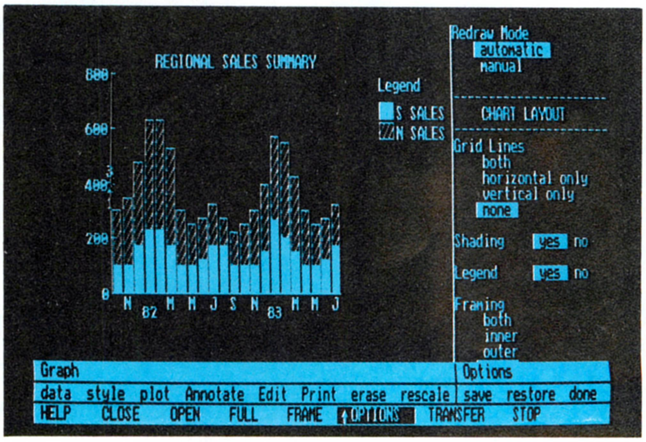
If you select the Tutorial, one of the many unique features of VisiOn comes into play: the hourglass cursor. As the tutorial program is brought in off the IBM XT's hard disk (and there is the inevitable, slight delay), the pointer changes from the shape of an arrow into an hourglass. Most software simply changes its prompt line to read "busy" or "please wait" to reassure the user that something is indeed happening, but the hourglass pointer is more effective simply because the eye is invariably fixed upon it at the moment VisiOn "goes away" to take care of business.

The tutorial takes little for granted. One of its first pieces of black-on-white text explains the concept of a window. "This text is in a WINDOW whose name is Tutorial. Each window's name is in its top border. Many windows may be on the screen, but only one can be active." The active window always has a wider border around it then the others, and if the "papers" on the VisiOn "desk top" happen to overlap, the active window is the one on the top.

You quickly learn that you may not see the entire contents of a window at the same time, but that the button on top of the mouse marked Scroll allows you to move a window's hidden contents down or over into the window at three different speeds. Alternatively, you can enlarge the size of a window by selecting the Frame command from the bottom of the screen. When prompted, you select where you would like the new upper-left corner of the window to be, and then move the pointer toward the desired lower-right corner. As the pointer moves, the rubber band lines of a new frame stretch with the movement, providing feedback on the size and shape of the window you're redefining.

The process is extremely intuitive. Although you read the prompts the first few times you stretch a window, with practice you will find yourself defining windows as quickly as you can point the mouse.

The approach of the on-line tutorial is all hands on. Rather than explain that each window has as many as five parts, then go on to define each—title, contents, prompt line, application menu line, and VisiOn basic command line—the tutorial simply makes you use them. For example, it guides you through asking for help on particular commands: You select Help from the basic command line at the bottom of the screen, read the prompt line (which tells you to select the thing you want help with), read the contents of the window for the Help message, and then select Quit from the Help application menu line, which reactivates the previous window and puts you right back to what you were doing.



Redraw Mode
[✓ automatic]
manual

Grid Lines
both
horizontal only
vertical only
[✓ none]

Shading [✓ yes] no

Legend [✓ yes] no

Framing
both
inner
outer

To use VisiOn Graph, select pie or bar format, enter your data, and watch the program plot your graph.

This Help section not only teaches how to get the help—regardless of which command in which VisiOn application you need additional information on—but also about the basic structure and use of a window.

All told, the tutorial takes less than half an hour and leaves you with the confidence to just go ahead and try things, asking for help when necessary, knowing that every response from the software will be quick, consistent, and easy to understand.

The VisiOn applications

One of the big pluses of the VisiOn Calc spreadsheet, in addition to its size, is its use of the mouse to move the cursor from cell to cell. Although either the arrow keys or keyboard can be used to move the cursor to a particular location, it is often more convenient to move the cursor simply by pointing.

The visual distraction of the rather large block cursor moving across the screen at full mouse speed proved irritating to some early test users of the program, however, so VisiOn Calc allows the option of marking the current cell location with lines instead of the block.

Beware: There is more there than the standard, ready-to-use, rather basic setups one sees when first learning the VisiSeries applications; it is the Options window that gives the expert user access to the full power of VisiOn programs. The Options command is one of the standard choices on the main VisiOn menu line at the bottom of the full screen. The advanced user who works with several large worksheets and doesn't want to wait for them to be recalculated every time he changes a value in one cell, for example, simply selects Options, then the VisiOn Calc window, and when the Options window appears, he simply scrolls down to the menu choices under recalculation mode and selects Manual.

Changing some of the options—enlarging the standard

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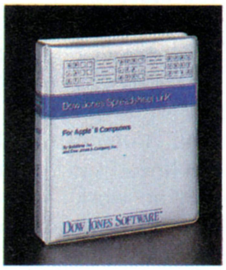
Douglas Gill
Grayson Gill, Inc.



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column width from nine to 12 characters, for example—has an immediate effect on spreadsheet windows currently visible on the screen, allowing the user to judge the appropriateness of the change immediately. And if the changes you make affect a file's appearance, those options are saved with the document.

One point may distress the user of VisiCalc who has mastered the original spreadsheet's slash commands: Those commands do not work with VisiOn Calc. "The nomenclature of the slash commands is quick," says Lynn, "but somewhat less intuitive than we wanted for VisiOn. And we wanted the meaning and flavor of VisiOn commands to be consistent. It wouldn't do to have the right arrow key mean 'go to the right' in one program, and then 'close cell and go the right' in VisiOn Calc."

For those of you who have used VisiWord, you should be happy to hear that VisiOn Word is fairly faithful to the original, although it has several interesting new features. Boldface type, italics, underscores, and superscripts all appear in the window workspace—VisiOn provides these character sets as part of the software operating environment—and, given an appropriate printer, what you see up in the screen window (including those special typefonts) is *exactly* what will appear on the printed page. And because of the multiple window capability, it's easy to view different parts of your document at the same time or to refer to another document.

Since it's impossible to do touch typing while holding a mouse, the IBM's function keys are used for the bulk of VisiOn Word's commands. Although they usually will not be selected with the mouse during text entry, the commands still appear in the expected place at the bottom of the window for consistency with other Visi applications. Besides, you'll be glad they are there when you start editing, because the mouse is very handy for such functions as moving text. All you do is point to and select the "cut and paste" command, the beginning and end of the text to be moved, and the text's new position. Voila, you have cut and pasted successfully.

Using VisiOn Graph, which is based on the previously available VisiTrend/Plot, is a matter of selecting a format (pie chart, bar chart, etc.), entering the series of data to be plotted or transferring it from another window, and watching the program plot your graph. VisiOn Graph automatically scales your chart to the size of the destination window. It can also preview the chart in its final form—what you see on the screen is exactly what the printer will produce as far as size and shape.

Although printing a graph requires only that you decide what format you wish, the options window is available to add enhancements, such as grid marks, borders, or white backgrounds. Titles and legends can be added, resized, and moved about with the mouse. Graphs can be printed on paper up to 11″ by 17″, and up to 12 colors are available if your printer can handle that many. Supported printers and plotters include various models from Bausch and Lomb, Hewlett-Packard, Epson, NEC, and Qume.

Not ready at the time of the first VisiOn shipments, but scheduled for release before you read this, VisiOn Query is a data-base management system built around the idea of tables with some what-if and what-is capabilities thrown in for good measure.

The transfer command

One key advantage to the VisiOn environment is the ability to move what appears in one window to another window. A similar ability, allowing information contained in a spreadsheet to be graphed quickly and some additional text added, is largely responsible for the success of such integrated programs as Lotus 1-2-3. But VisiOn's application manager provides more flexibility.

You can bring up a table under VisiOn Query in one window and use that application to select a certain logical subset of the data, move the subset to a Calc spreadsheet for manipulation in another window, graph the bottom line of the spreadsheet in yet another window using VisiOn Graph, and finally move the graph to a letter being produced using VisiOn Word. The question is, how easy is it to move things from one window to another?

Pretty easy. In sequence, you must select the Transfer command, the window containing the information to be transferred, and then the starting and ending points of the area to be transferred (which is highlighted so you know you got what you wanted). Then you select the window to which the information is being transferred and point to where the beginning of the block being transferred is to go. Prompts guide you the whole way, and the transfer program will simply not let you transfer information between incompatible sources and destinations.

It isn't that the program actually prevents you from making a transfer between one kind of window and another; rather, VisiOn simply insists you go about making the transfer in another manner. For example, you cannot transfer a paragraph of text from a VisiOn Word window into a VisiOn Graph window unless that window shows the Edit rather than the Graph menu.

And if you transfer a section of a VisiOn Query worksheet to another VisiOn Query window, for example, the numbers are stored as text and are not suitable for calculations. All in all however, the exercise is quite simple and flexible.

VisiOn is a lot of software. It requires a 512k IBM XT to run (which means 10Mbytes of hard disk storage). Moreover, the full bundle including a mouse and the three application packages available carries a suggested retail price of $1795.

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CIRCLE 24

THE NEW HARD-DISK PORTABLE

by David Gabel, Senior Editor

With the popularity of portable computers being what it is today, it was just a matter of time before a company decided to enhance its system to include a hard disk. And Compaq, the company which brought us the IBM Personal Computer compatible, has done just that with the introduction of its newest machine, the Compaq Plus.

Designed as an IBM XT compatible, the Compaq Plus computer looks just like its brother, the Compaq. The difference is the hard disk encased inside the small case of this transportable computer. Compaq says the hard disk is not a standard 5¼″ drive, but a smaller, 3½″ unit, mounted in the space normally reserved for one of the bigger drives. The smaller size allowed the company to add more shock mounting than it could have had it used the larger unit, but it paid another dividend, too: Smaller size means lighter weight, and that means there's less energy to be dissipated by the shock-mounting apparatus. Thus the disk drive itself should be subjected to fewer shock accelerations than would a larger drive mounted in the same enclosure.

Rod Canyon, president of Compaq, notes that the user's manual for the IBM XT gives detailed instructions for moving the Personal Computer because of the susceptibility of the hard disk in the computer to be damaged. On the other hand, Compaq officials say their transportable computer can be closed up, picked up, and carried away with no special precautions. They also say the computer can be dropped from desk-top height with no ill effects to the drive. "We even destroyed a system," Canyon says, "and the drive survived."

One-hundred percent compatible

The Compaq Plus is, according to Compaq, 100 percent compatible with an IBM XT. That means it will run any program that runs on the XT without any modification. Various manufacturers claim such compatibility, but Compaq says its Compaq Plus is different. "You need a deeper level of compatibility," Canyon says. "We can run Personal Computer and XT programs off the shelf."

But a plug-compatible mainframe manufacturer makes money either by offering what IBM makes for less money, or by offering *more* for roughly the same money IBM charges. So, Compaq offers some things IBM doesn't in the Personal Computer XT. One is the Compaq Plus's graphics support. With an XT, you have to get a graphics controller to use graphics; not with the Compaq Plus. Graphics comes standard with the package. There's also a better character set; the Compaq Plus can display characters in a 9-by-14 character dot matrix on the screen. Although the screen in this transportable computer measures only 9″ diagonally, this character matrix makes for a very readable display.

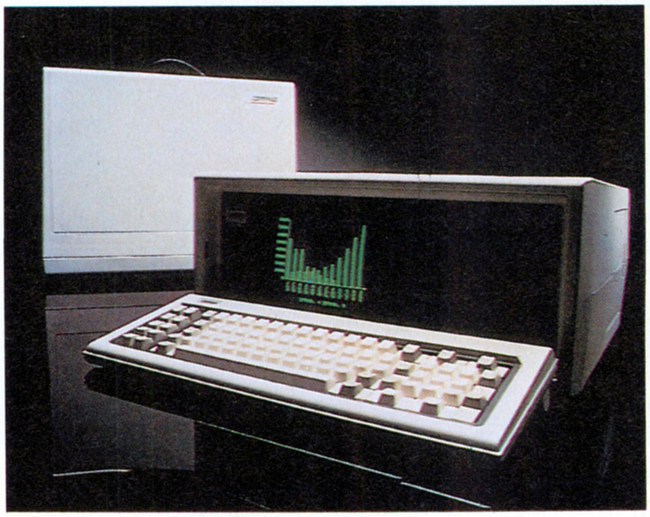
These additional offerings are very nice, but the real plus Compaq brings to the party is portability. The computer closes up into a package small enough to fit under an airplane seat. The computer weighs 31 pounds—heavy, but not impossible. You probably wouldn't want to carry it on a camping trip, but from office to car to home and back again is certainly feasible.

The birth of a computer

Compaq unveiled its new baby at a press conference in New York, in conjunction with its dealer training. *Personal Computing* got its hands on the machine at the dealer training site.

Joel Stanford, a dealer hot-line representative who helps Compaq's dealers solve any problems with the Compaq computers, provided us with a demonstration.

We decided to work with one of the computers which had 1-2-3 from Lotus Development already installed on the hard disk. It was in the back of the room, and we wanted to use it at a table in the front of the room where we would be more comfortable. So, we just closed the computer, and picked it up. It felt about as heavy as a portable sewing machine as I carried it to its new location.



The Compaq Plus Portable computer weighs 31 pounds and has a 3½″ hard-disk unit.

I used 1-2-3 to build a simple budget model. The program is similar to other spreadsheets I've used, so it didn't take me very long to get the hang of it. The computer's function keys, identical to those of the IBM Personal Computer's keyboard, help out a lot in using this program. You can flit around the spreadsheet with the greatest of ease.

(continued on page 42)

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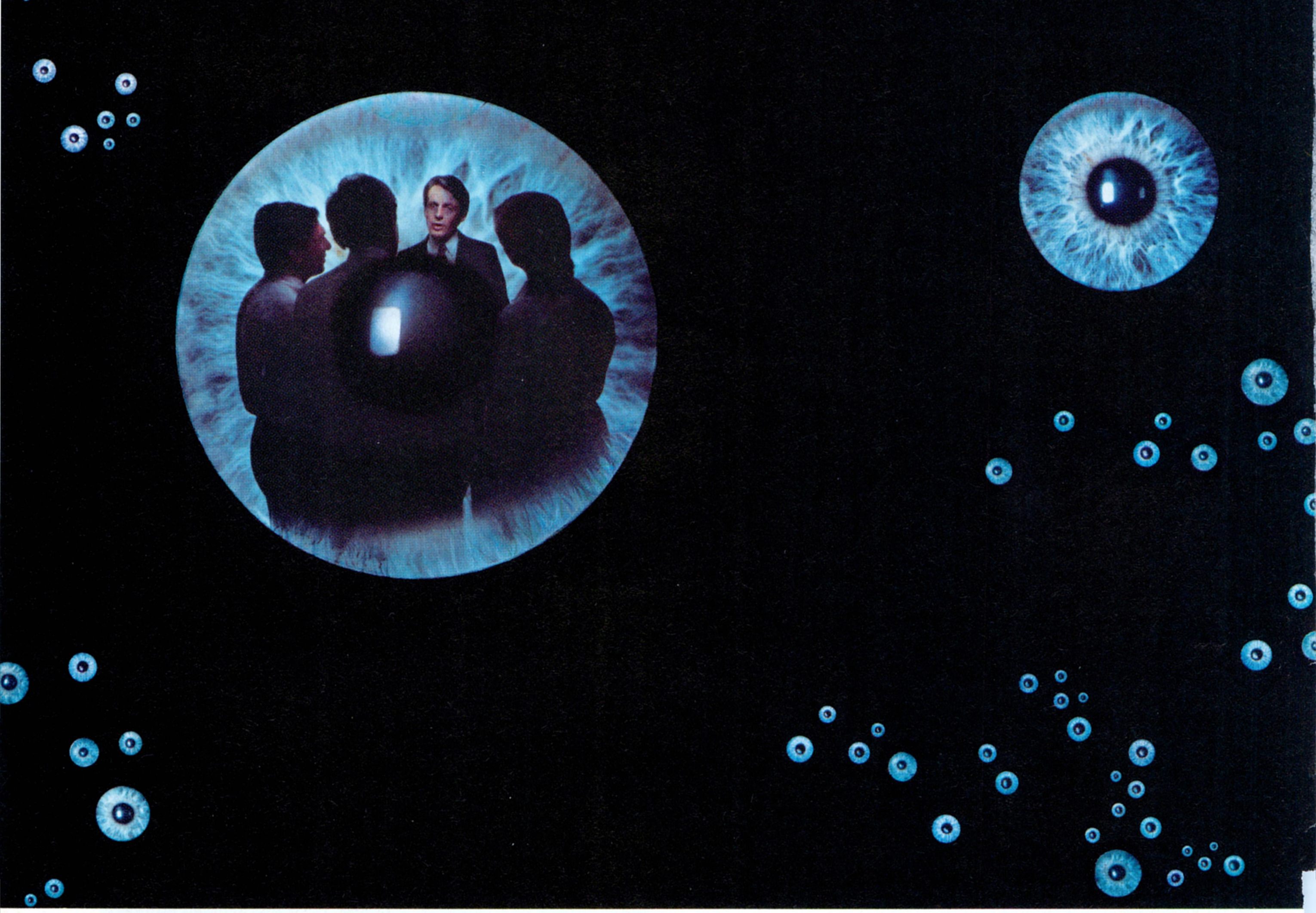

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(continued from page 39)

After our little spreadsheet demonstration, Stanford showed us the difference in the character sets. He brought up the disk directory, and pressed a few control keys to change to the standard IBM character set. The screen changed from a soft green to a very harsh green—I had to look away for a moment, until I got used to it. Stanford says that the computer changes its horizontal scanning frequency from 15.7 to 18.3 KHz to allow for more scan lines on the screen. You can also change the number of scan lines separately using control keys.

Another nice feature is the audible feedback from the keyboard. Every time you push a key down, you get a click. The volume can be adjusted so that if you don't happen to care for the constant click, simply turn down the volume. If, however, you're working in a noisy office and need a little more feedback, you can turn it up.

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A POWERFUL DATA BASE THAT UNDERSTANDS ENGLISH

by Paul Bonner, Associate Editor

When I started looking for a data-base management system for my IBM Personal Computer about six months ago, I compiled a short list of features I considered necessary for my purposes. Then I set out to examine every data-base program that passed through our offices. I was actually certain that I would find an ideal data base in a short time. Granted, some of the requirements I had were rather specialized, but even in retrospect, I don't think any of them were out of line. All I really wanted was a powerful but easy-to-use program that would be compatible with the other software I use on my IBM.

Much to my surprise, my search for a data-base system took six months. But at last I've come up with a winner: Power-Base from GMS Systems, Inc. This package meets all of my needs so well that any doubts I had as to the fairness of my requirements are gone, and I'm once again convinced that the problems I encountered earlier in my search were due only to the inadequacies of the packages I examined before I encountered Power-Base.

First off, to meet my goal of software compatibility, I knew that the data-base manager I chose would have to be on a standard MS-DOS disk (the kind in which when you type DIR at the "A>I prompt, you see a file directory, not random garbage).

This was important to me for two reasons. First, I do all my writing on Apple-formatted disks, using Quadram's Quadlink board, and the system reset required to boot nonstandard MS-DOS disks wipes out the hooks Quadlink puts in the operating system. Second, I also make use of operating environments (such as Quarterdeck DesQ or Memory/Shift from North American Business Systems) that partition the IBM's memory, allowing several programs to be co-resident in RAM.

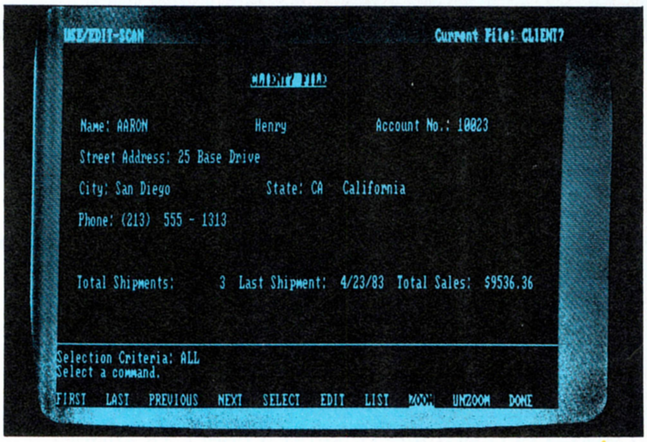
My other requirements were equally simple. I wanted a data base that was written in Assembly language, or at least some language that's faster than BASIC. (Surprisingly, that requirement alone eliminated a lot of database programs during the course of my search.) And, I didn't want to have to spend several days, or even a week, learning some advanced "data-base language" before I could even begin to design a form. There are certainly some highly specialized applications for which the flexibility of a special data-base language is necessary, but I don't need anything that specialized, and I doubt that most of the people who struggle with such a language will ever really need it, either.

Instead, I wanted to be able to design a form and start entering data within an hour or two of opening the package. And I wanted a data base that was sufficiently forgiving to allow me to change the form I've designed, *and the data I'd already entered*, should I decide at some point that, for instance, I should have allocated more than 10 spaces for someone's title.

That's all I wanted. Was that too much to ask?

I guess it was. But after my exhaustive search I did come up with some good news: Power-Base not only meets my requirements, but it also makes them seem laughably simple by providing a seemingly endless array of powerful features that I hadn't even thought to demand.

Designing a form with Power-Base is refreshingly simple compared to the gyrations you must go through with most data-base systems. You simply move the cursor (using the arrow keys) to the point on the screen where you want an



```
USE/EDIT-SCAN                                     Current File: CLIENT?

                          CLIENT? FILE

 Name: AARON               Henry            Account No.: 10023

 Street Address: 25 Base Drive

 City: San Diego            State: CA   California

 Phone: (213)  555 - 1313


 Total Shipments:       3  Last Shipment:  4/23/83  Total Sales:  $9536.36


Selection Criteria: ALL
Select a command.
FIRST   LAST   PREVIOUS   NEXT   SELECT   EDIT   LIST   ZOOM   UNZOOM   DONE
```

Power-Base, a powerful data-base management system from GMS Systems, Inc., has rapid search features.

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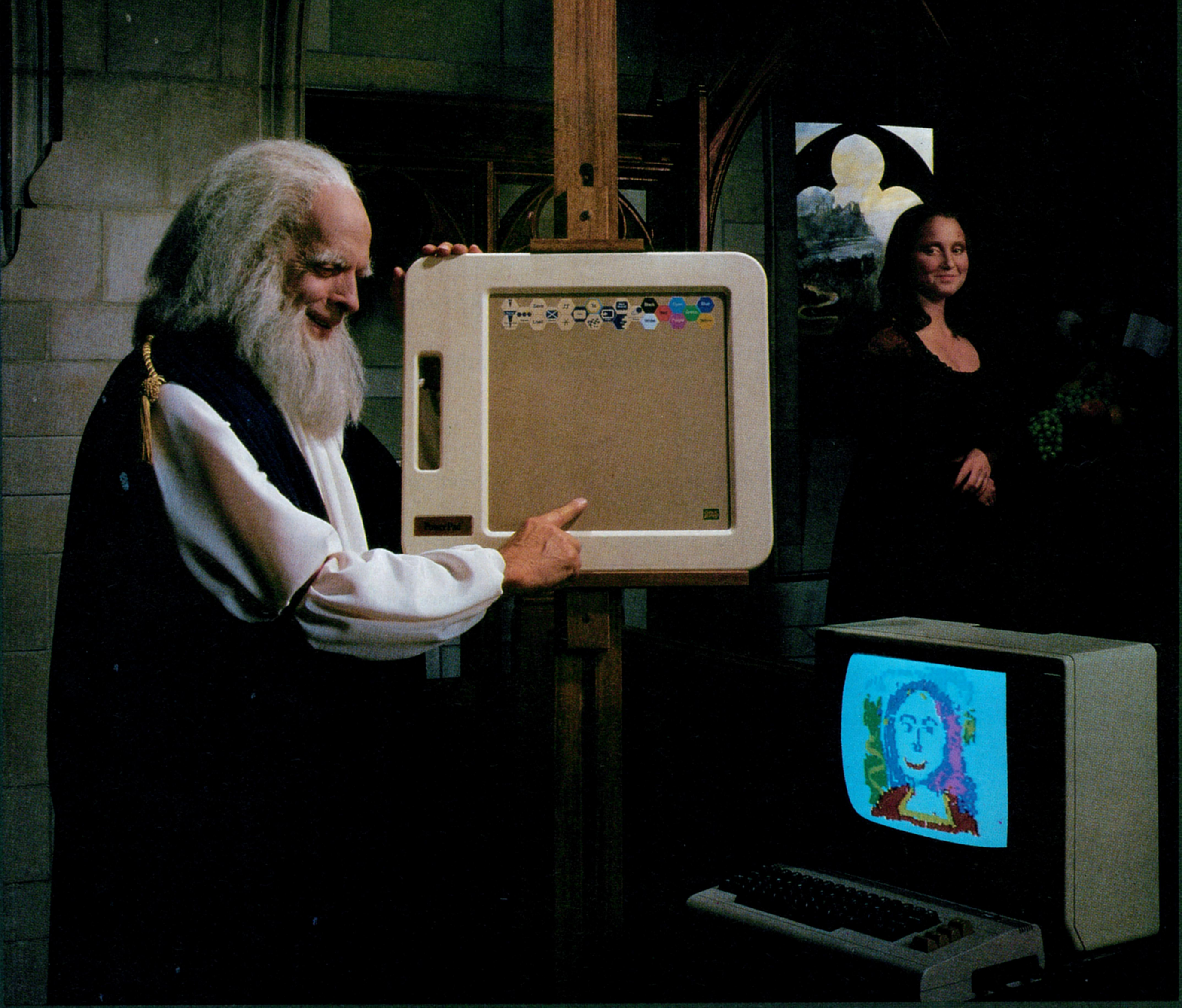

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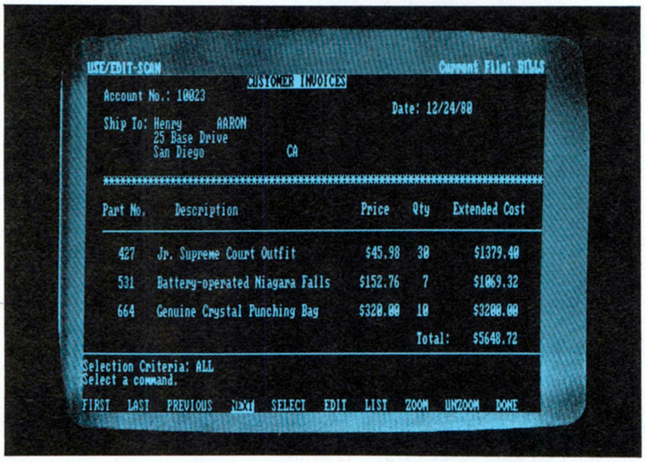
CIRCLE 133

entry field to appear, and then select the Build Field option from the command menu that stretches across the bottom of the screen.

You are first asked to enter the screen prompt for the field, and then to state whether the field is to be a screen title, a calculated value derived from a mathematical formula, a field whose value is looked up from another file, a field whose values are entered by the user, or a field whose value will be computed as a statistical function (i.e., Sum, Average, Minimum, Maximum, or Count) applied to a field in another file. For user-entry fields, you then specify the type of value to be entered (alphanumeric, date, number, money, or yes/no), the size of the field (one to 80 characters), the number of decimal places (if appropriate), and whether the prompt and/or the entered value should appear on the screen as inverse or bright type rather than normal type.

You can also specify entry rules for each field, such as the minimum and maximum values of the entry, whether an entry is required, whether every space in the entry line must be filled, whether only uppercase entries will be accepted, and whether a Help message should be displayed when the user is about to enter something in the field. Finally, you can specify that the field be subject to Table-Validation, which means that the values entered by the user will be looked up in a designated field in another file to make sure that they are valid.



```
USE/EDIT-SCAN                                                Current File: BILLS
                           CUSTOMER INVOICES
  Account No.: 10023
                                                   Date: 12/24/80
  Ship To: Henry     AARON
           25 Base Drive
           San Diego             CA

  ******************************************************************************

  Part No.    Description                       Price    Qty    Extended Cost

    427    Jr. Supreme Court Outfit           $45.98   30        $1379.40
    531    Battery-operated Niagara Falls    $152.76    7        $1069.32
    664    Genuine Crystal Punching Bag      $320.00   10        $3200.00
                                                       Total:    $5648.72
Selection Criteria: ALL
Select a command.
FIRST  LAST  PREVIOUS  NEXT  SELECT  EDIT  LIST  ZOOM  UNZOOM  DONE
```

Listing the shipping information lets you see the bill as the customer will see it, so you can check it for errors.

To understand how this feature would be used, imagine that you are filling out a form that's been designed for use as an invoice. If you've specified that the Customer # field on the invoice is subject to table-lookup in another file—perhaps called Customer List—you could ensure that the customer number you enter is valid, since the program would not let you enter a customer number that did not appear in the Customer List file.

By taking this example a little further it's easy to see some of the real power that earns Power-Base its name. Once you've entered a valid customer number, you could have the program automatically fill in a number of the fields on the form by retrieving their values from other files. For instance, say the customer number you enter is 09037. You can have Power-Base automatically go through your customer file, find out that 09037 is Mr. Waldo Remark, and then examine your Customer File for Mr. Remark. That means that once you've filled in Mr. Remark's customer number, the program can automatically fill in his name and address, any past balance on his account, and the billing terms for his account.

Datazoom

We've saved the best for last. Like most data bases, Power-Base allows you to specify a number of fields as search fields when you set up your form. Actually,you can search for any item on any entry line on your form, but if you've specified that line as one of your six search fields, the search is much more rapid. And combined with the ability to look up values from other files, these search capabilities make Power-Base an impressive data base. But another feature—Datazoom—takes Power-Base even further, by giving it three-dimensional capabilities.

Let's take another look at the files we've discussed above. Say that as you fill out Mr. Remark's invoice, the program, after automatically checking his record, writes $4000 in the balance past-due field. This amount is too high for your liking, so you move the cursor to the Customer # line, and select Zoom from the menu at the bottom of the screen. The program automatically clears the screen and displays Mr. Remark's billing and payment history, because you've established a Zoom-Link between the two fields while setting up your form. (You established the link merely by telling the program that you wanted one.) When you're finished examining Mr. Remark's billing record, you select Unzoom from the menu, and the program automatically returns you to the invoice you were working on.

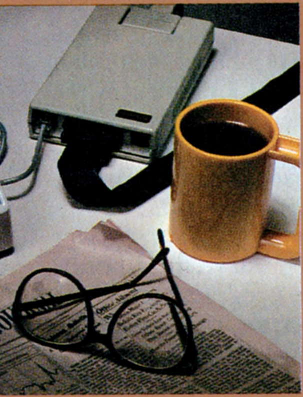
At about this point you're probably saying something like,"Well, linking all those files sounds wonderful, but based on every data-base system I've ever seen, I'd have to work for weeks to plan all of my forms so that they would link correctly." The neat thing about Power-Base is that while careful planning of your interlocking files is certainly a good idea, you can change any form at any point, and the program will do its best to adapt all the data records you've already entered.

Power-Base for the IBM Personal Computer or XT retails for $475.

FOR MORE INFORMATION: GMS SYSTEMS, INC., 12 West 37th St., New York, NY 10018; (212) 947-3590.

(continued on page 48)

MAKE



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(continued from page 45)

FASTER THAN A SPEEDING ARTIST

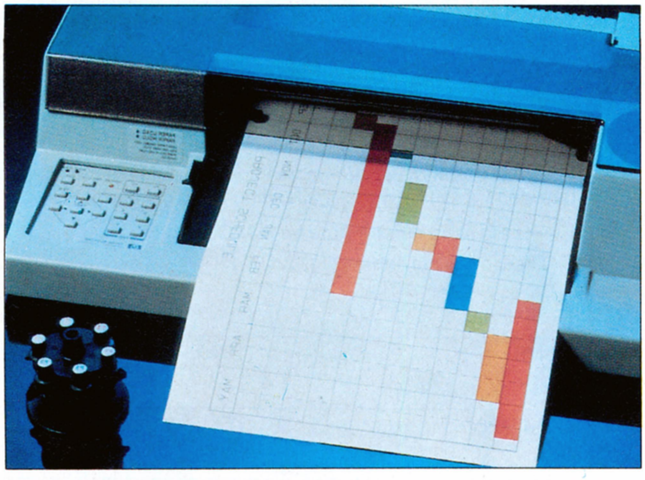
by Paul Bonner, Associate Editor

The first clue that there was something different about the new Hewlett-Packard 7475A graphics plotter came as I was scanning a fact-sheet on the product just before the nice gentlemen from H-P demonstrated it for me. "2g pen acceleration," the fact sheet claimed. What are they talking about? I wondered. Measuring pen acceleration in g's?

It sounded awfully pretentious to me, like talking about the horsepower of a can opener. OK, I thought, HP's been getting a lot of competition from all those low-priced plotters I've seen at trade shows recently, so now they want to introduce a new six-pen model and drop the price of their two-pen 7470A. But everybody knows that plotters are slow. So what's this "2g pen acceleration"?

Thanks largely to their model 7470A, the Hewlett-Packard name comes to mind when you think of plotters—nearly as quickly as that of Epson does when you think of dot-matrix printers. HP's two-pen 7470A graphics plotter set the de facto industry standard for plotters, almost from the day it was released. Today, any graphics program worth its salt supports the 7470A, and most use it as the default choice in their configuration programs. So, a new plotter from HP was news.

Thus, whether I believed "2g pen acceleration" or not, I was anxious to see the new 7475A. After a few pleasantries, the men from HP switched the 7475A on and initiated its self-test/demonstration mode. And instantly I saw the light. Two g's acceleration? You bet. Drawing speeds of up to 15″ per second, too. That thing could move.



The new Hewlett-Packard 7475A graphics plotter offers speed, versatility, and precision for high-quality output.

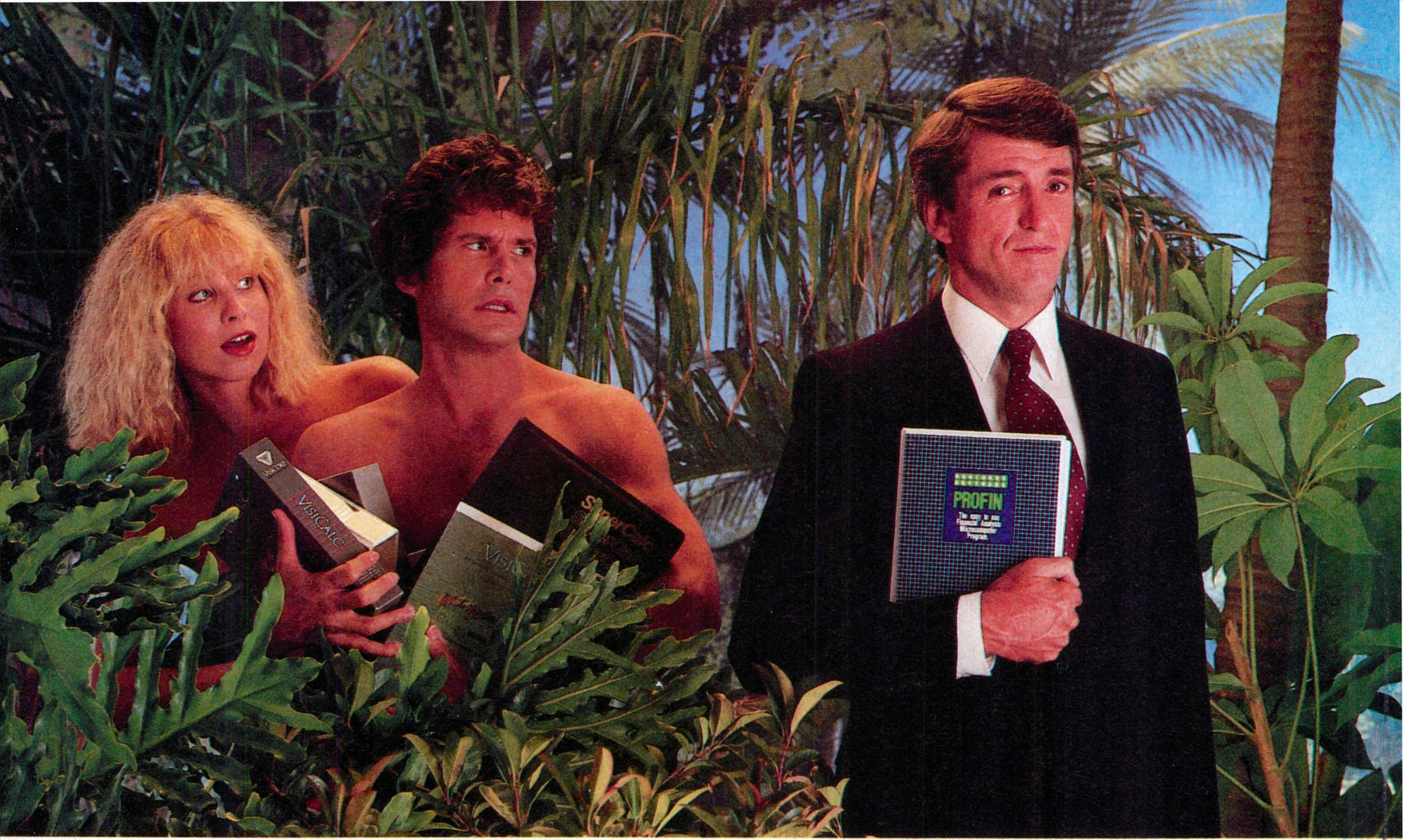
The drawing arm raced across the plotting surface, automatically selected a pen from the six-pen carousel, raced back to the paper, hesitated for just a second while it did a few thousand calculations of pi to determine the area of a circle, and then started drawing feverishly.

Very impressive indeed. From what I've seen, most of the low-end plotters on the market today should come with instructions for you to go out to lunch—and have an extra cup of coffee, you've got the time—while they inch away at your chart or whatever it is you've asked them to plot for you. Except that with those one- and two-pen models, you've got to be around to change pens all the time. With this thing, though, all you've got to do is be available to insert more paper and tell it to plot another one. It really is fast. Three minutes or less to draw a six-color graph, instead of 15 minutes or so with cheaper models. Actually, the pen acceleration and maximum drawing speed of the 7475A are the same as those of the 7470A, but they're far higher than those of the $600 models we've seen recently, and having six pens on the 7475A instead of two will, no doubt, further increase output speed.

So, it looks like a great plotter. But what else would you expect from Hewlett-Packard? Well, how about software support? Here we have a brand new plotter, and sure the thing understands 50 commands from Hewlett-Packard's Graphics Language, but who is going to go to the trouble of programming for their plotter? What about over-the-counter packages? Not to worry. The 7475A is software-compatible with the 7470A. That means that if you use PFS:Graph, Apple Business Graphics, Lotus 1-2-3, Graphwriter, GraphTalk, GraphPlan, or any other program that supports the 7470A, you already have software for the 7475A.

Speed is a nice feature in any peripheral. One wonders, though, whether speed alone justifies spending $1895 for the new 7475A when there are several plotters on the market for around $600. But Hewlett-Packard doesn't seem to be worried about its low-priced competitors. The 7475A is packed with features. HP's attitude toward its price seems to be: "People will recognize quality when they see it." HP is not about to get into any price wars, it's just delivering a good product.

What makes the 7475A a good product? What makes it worth three low-end plotters? The speed advantages of this new unit are one strong point in its favor, and the convenience of a six-pen carousel is another. A third is the precision with which the 7475A plots. It has line-resolution as fine as 0.001″. More important, it is almost foolproof. With a lot of the low-end plotters we've seen, great care is required when you insert the plotting paper to make sure that the paper is aligned correctly and that it doesn't slip during plotting. With the HP 7475A,



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you simply lift the paper-load lever, slide a piece of paper into the plotter, and lower the lever.

Versatility

Another of the 7475A's strong points is its versatility. Available with either an RS-232-C interface or an HP-IB (HP's enhanced version of the IEEE-488 bus) interface, the 7475A is compatible with a broad range of computers, including those manufactured by IBM, Apple, DEC, Commodore, Compaq, and, of course, Hewlett-Packard.

Most of the lower-priced plotters on the market handle one size of paper: 8.5″ by 11″. The 7475A can plot on either paper or transparent acetate of that size, or paper in 11″ by 17″ sheets. For plotting on paper, fiber-tipped pens are available in 10 colors and two sizes, while for transparencies seven colors and two sizes are available.

In sum, what you get for your money with the Hewlett-Packard 7475A graphics plotter is a versatile, easy-to-use unit with ready-made software support and high-quality output. If you're considering buying a plotter, you should certainly check out the 7475A.

It is available through Hewlett-Packard dealers.

FOR MORE INFORMATION: HEWLETT-PACKARD CO., Inquiries Manager, 1820 Embarcadero Rd., Palo Alto, CA 94303.

PROPERTY MANAGEMENT MADE SIMPLE

by Craig Zarley, Associate Editor

The rent was due yesterday, your sink is backing up into your refrigerator, and the landlord is on vacation. You'd like to make a big deal out of getting some help, but you're subletting the apartment from your boss, who's on vacation—probably with the landlord . . . Most tenants of apartment dwellings find it frustrating to live with situations like this, but for the people who manage the building—the property managers—it may be just as frustrating. Property management usually comes down to a complex shell game of which tenant occupies which rental unit at what price, who's paid the rent, and who's delinquent. And, if you're a professional real-estate manager, you're also responsible for giving the owners of the property a constant account of their holdings, detailing the rent paid, what repairs have been made, and the amount of return on investment.

Systems Plus, Inc., maker of the popular Landlord property management system for the IBM Personal Computer and Apple II, has just introduced an enhanced CP/M version of the package designed as a complete property management tool. The CP/M version eliminates many of the restrictions inherent in earlier versions, and can be used with a hard disk to provide financial, property, and accounting information on an unlimited number of owners, tenants, and service vendors. The only limit on how much you can manage is the capacity of your hardware.

The new Landlord allows you to post rents by the hour, day, week, month, year, or any period you define—you aren't bound to use the standard monthly rent cycle. Having the freedom to determine the rental period broadens the types of property you can manage—resort property might rent by the week, and parking rentals might be figured by the hour or day.

Thinking like a landlord

The Landlord is divided into two major systems—the Property Manager and the Financial Manager. The Property Manager lets you store and update information on rental properties such as apartments, houses, mini-storage units, or parking garages. Essentially, any group of rental units you manage from campground spaces to parking spots is fair game for The Landlord. You can keep track of past, present, and future tenants, and you can maintain records such as security deposits to see which tenants are behind on their rent payments.

The Financial Manager is a complete accounting system that keeps track of all payables and receivables pertaining to each account. When you integrate the two systems together, what you get is a complete real estate management system.

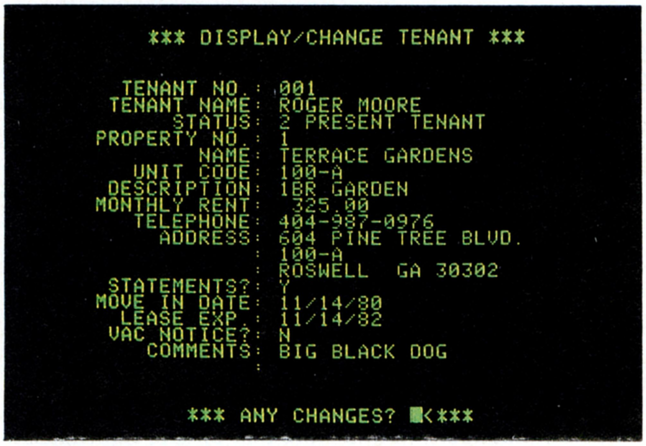
Most of the work involved with The Landlord comes in transferring your rental rolls onto the computer. The program features a series of easy-to-follow menus that make data entry simple. Because The Landlord is a combination of two integrated systems, the program gets complex only in that there are many different application modules. Once you've set up your files, learning the program amounts to exploring all the territory The Landlord covers. But the menus are there to help you at each turn, so it's difficult to get stuck.

Building the files

When you first start out, you list all of your clients by number, name, and tax rate. The tax rate corresponds to the tax bracket of each individual owner. The program keeps track of that tax rate for each owner and helps figure the net return on each property at the end of the year.

Next you enter information pertaining to each property. The Landlord automatically assigns the next available property number. You type the property name and address. You're also asked for the owner number and owner name. Since you've already established your owner file, you just enter the numbers and the system automatically assigns the owner name to each file.

You also build files for each rental unit within a property by developing a unit type file in which you assign



```
           *** DISPLAY/CHANGE TENANT ***

     TENANT NO.: 001
   TENANT NAME: ROGER MOORE
        STATUS: 2 PRESENT TENANT
  PROPERTY NO.: 1
          NAME: TERRACE GARDENS
     UNIT CODE: 100-A
   DESCRIPTION: 1BR GARDEN
  MONTHLY RENT:  325.00
     TELEPHONE: 404-987-0976
       ADDRESS: 604 PINE TREE BLVD.
              : 100-A
              : ROSWELL  GA 30302
   STATEMENTS?: Y
  MOVE IN DATE: 11/14/80
    LEASE EXP.: 11/14/82
   VAC NOTICE?: N
      COMMENTS: BIG BLACK DOG
              :

              *** ANY CHANGES? █K***
```

With The Landlord, you can build individual files to keep up-to-date information on each unit you lease.

a number code for different unit types. The number 1, for example, might correspond to a one-bedroom, unfurnished apartment. You can enter a standard monthly rent for this type of unit, and the system keeps track of the rent. If in the future you wanted to raise the rent on all one-bedroom unfurnished apartments, you would just enter the unit code number, change the rental figure, and The Landlord automatically changes the rent on all similar units. One nice feature, however, is that the program keeps track of lease expiration dates, so that even though you raised the rent on a particular unit, the new price won't go into effect until a lease expires.

When you're building your rental unit file, you have to figure out in advance what order you want the units to be listed in. If the property is an apartment house, you'll probably want to list them in sequential apartment numbers. The Landlord gets a bit inflexible here. If you add units out of sequence, there's no way to go back and rearrange the entries.

The tenant file amounts to a complete status report of each rental unit. All you do is type in a tenant name and the program automatically assigns a tenant number. Then, after the tenant name, you enter a status code number with the number 1 corresponding to future tenant, 2 to present tenant, and 3 to past tenant. The Landlord automatically stores tenant history. If you want to find the name of the previous tenant for any property, you enter the number 3 beside the status code and the program displays the name.

The property number, name, unit type code, rent, and address are all part of the tenant file. Since you have already entered this information in your rental unit files, you just enter the appropriate codes and the program displays the property name, address, and rent instead of retyping it for the tenant file. This file lets you record move-in and lease-expiration dates. There is also space to list whether vacancy notice has been given, and a brief comment about each renter.

Generating reports

After you've established your tenant files, it's easy to keep track of rental payments. One of the options on your file-management menu is tenant payments. Call up this option, enter a tenant number, and you get a listing of previous balance, charges, payments, and present balance. Just enter any charges or payments, and The Landlord automatically refigures the account.

But The Landlord does more than just keep track of payments. The best feature of the program is its report-generating capabilities. You can print a tenant-payment report that can tell you all transactions on each past, present, and future tenant's account for an individual property, all properties, or for a specific owner. Or suppose you're managing 1000 different tenants, and want to know who is overdue on their rent. The delinquency report will list all renters with balances outstanding.

Integrating the numbers

The Financial Manager part of the program integrates your property files with a complete accounting system, allowing you to set up such things as a vendor file for painters, plumbers, hardware stores, or other accounts. You can also load in the check register module to keep your checking account on the computer and generate printed checks.

The Landlord comes with order forms for accounts payable checks and tenant statements that are designed to work with the program. As payments are disbursed, the program records them so you can get a printed report of all disbursements for the month for a specific property, all properties, or a particular owner.

Another nice feature of The Landlord is its property and tax-analysis report. At year end, owners need a financial analysis of holdings to determine net gain on each property. These reports can help you, as owner, see if you're charging enough rent or if your profit margins are such that you should sell or retain the property. You get a complete accounting of income and expenses on an individual property, or a complete real estate portfolio scale. And because the program knows the tax bracket of each property owner, it figures in the tax consequences to give a more accurate picture of your profit or loss for the year.

The CP/M version of The Landlord is written in MBASIC and requires 64k RAM and two disk drives. The program can run on the Apple IIe, Apple II Plus, and the IBM Personal Computer with appropriate CP/M cards. The Landlord has a suggested retail price of $895.

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CIRCLE 34

Inside Apple

Vol. 1, No. 4

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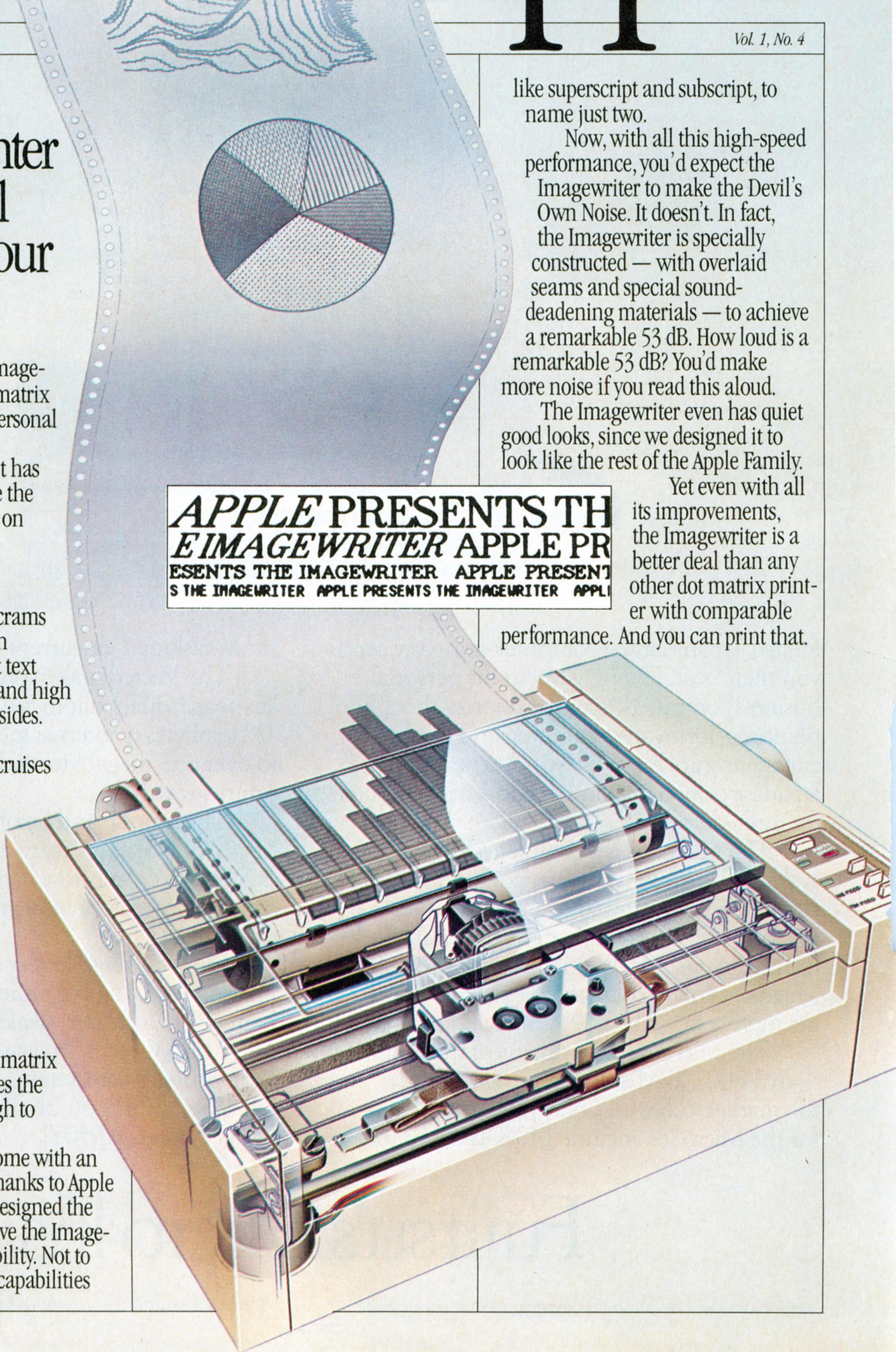
Yet it's just as at home with an Apple III or Apple IIe. Thanks to Apple software experts who designed the control electronics to give the Imagewriter perfect compatibility. Not to mention some special capabilities like superscript and subscript, to name just two.

Now, with all this high-speed performance, you'd expect the Imagewriter to make the Devil's Own Noise. It doesn't. In fact, the Imagewriter is specially constructed — with overlaid seams and special sound-deadening materials — to achieve a remarkable 53 dB. How loud is a remarkable 53 dB? You'd make more noise if you read this aloud.

The Imagewriter even has quiet good looks, since we designed it to look like the rest of the Apple Family.

Yet even with all its improvements, the Imagewriter is a better deal than any other dot matrix printer with comparable performance. And you can print that.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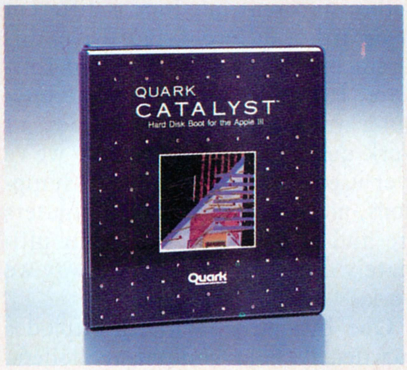

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CIRCLE 88

Macintosh: Apple's Powerful New Computer

It converts speed into power, and what you get is the kind of performance that's unmatched at the price

By Charles Rubin, Associate Editor

Nine years ago, Apple Computer issued a challenge to the world. With its personal-computer concept, Apple challenged us to change our attitudes about what computers were, and how we used them. Millions of us took up the challenge of this new way of working and thinking, and the ways of computing spread among us. It was the way of Control keys and cursors, dual floppy disk drives, and green monitors. Today most of us know at least these totems of the computing experience, and with this knowledge, we think we know what personal computing is.

But times have changed. Apple has just issued a new challenge—a challenge that explodes all of our comforting personal-computing standards and beckons us, once again, into the future.

Apple's challenge is called Macintosh. The new computer, introduced on January 24, is a little box with a different monitor, a different keyboard, a different disk drive, different interfaces, and different software. It doesn't look quite like anything we've ever seen, and it doesn't work quite like any computer we've ever used. It challenges our assumptions, not just about what computers are and how we use them, but ultimately asks us to rethink the way we work.

One by one, Macintosh explodes our dearly held computing beliefs, such as: The more RAM the better, or two 5¼″ floppy disk drives are needed for convenience and media compatibility, or green monitors are the only ones worth using, or computers need MS-DOS compatibility to run some needed software, or cursor control keys are necessary, or function keys are a must. Well, Macintosh has 128k of RAM which can't be increased, it has only one 3½″ microfloppy disk drive, its monitor displays black images on a light gray background, it has a proprietary operating system, it uses a mouse pointing device instead of cursor control keys, and it has no function keys at all.

But these changing beliefs about hardware and software specifications are just the beginning. We must also change some of our thoughts on computing traditions, such as: Hours must be spent just getting comfortable with a computer, or real functionality in a 16-bit computer costs about $4000. Instead, learning to use Macintosh takes half an hour or less; and with its true 16-bit processor, Macintosh is a little over half the price of other 16-bit machines.

So this Macintosh, this new product, is more than just another computer. It's even more than "The neatest product I've ever seen," as Apple chairman Steve Jobs calls it. It comes into the present-day world of computing like some futuristic siren, beckoning not just to the computer literate, but to the uninitiated masses, saying, "All your computing dreams are possible now. There are no more excuses for not learning about curves and expensive hardware. The power is there for anyone who dares to learn about it."

If it seems odd to be talking about some hunk of plastic, metal, and glass this way, it's because as a product, Macintosh is part hardware, part software, and part philosophy. It's as if Apple had this idea of some super-easy, super-smart Volkscomputer that would make tremendous computing power as easy to use as a telephone, and then figured out from there how to make it happen.

Emotionally appealing

Objectively evaluating Macintosh is difficult. Because of its ease of use, unique styling, and graphics capability, Macintosh has the kind of emotional appeal the Volkswagen Beetle once had. In an industry rapidly becoming a grey sea of IBM Personal Computer clones, Macintosh stands out. People—from our editors to third-party software designers who have used the machine—enjoy it.

Still, Apple is asking that we make some substantial sacrifices to use Macintosh, because of its lack of MS-DOS compatibility and its lack of hardware flexibility. The thousands of users who bought IBM Personal

Macintosh challenges our assumptions about what computers are and how we use them.

Computers with 256k to 512k of memory just to take advantage of Lotus 1-2-3's spreadsheeting capabilities won't find that same capability in Macintosh. And while software vendors surveyed by *Personal Computing* indicated that they are preparing a large number of programs for Macintosh, it will be some time before Macintosh can offer the range of software available right now for the IBM Personal Computer, its compatibles, and the Apple II.

If you accept these trade-offs, though, and if Apple's way of using a computer suits your needs, Macintosh represents a new standard in price/performance for personal computers. In fact, these limitations are what allow Macintosh to deliver so much for its price.

Photo by George B. Fry III

Macintosh, Apple's new 21-pound transportable computer, features the latest in hardware and software technology. It includes a mouse controller.

Macintosh's fixed design, which is geared to mass production, and its operating software, which is uncompromised by modifications for compatibility, allow Apple to cut Macintosh's cost to only $2495. Up until almost the time of Macintosh's introduction, there were arguments within the company about cutting the new computer's price to below $2000. Still, Apple came close to meeting Steve Jobs's goal of providing 70 percent of Lisa's capability for 20 percent of the price. Unlike Lisa, Apple's powerful computer that cost nearly $10,000 at its introduction one year ago, Macintosh does not provide multitasking, nor can it handle enormous spreadsheets in one contiguous piece.

What Macintosh does incorporate involves four key elements:

Built-In Lisa Technology is the conceptual soul of Macintosh. Based on early research by Xerox and brought to market in Apple's Lisa computer last year, Lisa technology is essentially a different way for users to interact with computers. Instead of staring at a blank screen and using a keyboard to enter commands that get files from the computer or make it perform various tasks, this approach shows you a screenful of labels and drawings, called icons, that represent options. To take an option, whether it's getting a file or seeing the contents of a disk, you "point" to the option you want and select it. You don't have to remember dozens of specific keyboard commands and file names and then type them in to do something with the computer; you just see and point. Another part of the concept is that options you may want to take are only presented when you need them, through graphic devices called pull-down menus. Since it's not possible to display every option available at a given time, options are grouped under labels. Selecting a label produces a submenu that lists that particular group of options, from which you make a selection.

The way this all works will be explained in detail later, but for now it's enough to say that Lisa technology means that using a computer becomes a visual, intuitive thing, rather than an exercise in remembering rigid command sets and file names. It makes the difference between computers that take days to master, and computers that take less than an hour to learn.

32-Bit Architecture is the hardware design that makes the Lisa technology possible in both Lisa and Macintosh. Both computers use the Motorola 68000 processor, which Apple feels is far more powerful than the Intel 8088 used in the IBM Personal Computer. Since a graphic display is at the heart of Macintosh, it's important that graphics be as crisp and easy to use as possible. Producing graphics is hard work for a microprocessor, and by using the 68000 Apple is able to make Macintosh's graphics display fast and clear.

Software From Leading Developers will be the fuel that powers the Macintosh engine. The software that provides the graphics-based computer control is provided by Apple in a permanent ROM (read-only memory), but the computer still won't do anything unless there are applications programs like spreadsheets and word processors to run on it. Apple began courting software developers early in Macintosh's development, and expects to bring the number of major software developers for the new machine up to 100 by February. Several major products from top software houses are expected to be available by summer.

An Unobtrusive Size is the final element of the Macintosh equation.

Apple worked to provide a user interface so simple you don't have to think about it, and they wanted the physical appearance of the computer to be equally unobtrusive; Macintosh occupies about as much space on a desk as a standard yellow notepad. It can easily stay out of the way when you don't need it, and at 21 pounds, it can just as easily go where you want it to. The $2495 price is also part of Macintosh's unobtrusiveness.

With these elements, Macintosh allows us to forget about the physical computer, and concentrate on our computing. This necessarily requires some trade-offs in terms of "standard" equipment, like the number of disk drives and the size of the monitor and RAM, but Apple's challenge is for us to accept these differences in the interest of improved computing ability. Apple is taking a chance here, because despite Macintosh's power and ease of use, its very uniqueness forces a decision from the buyer: Does he stick with the computers that others are using these days, or does he accept the challenge and step boldly forward to

THE SOUL OF A NEW APPLE

A coatless chairman of the board—his satin warmup jacket hangs in one of a row of identical cubicles near the conference room—is going on and on with quite some fervor about the best designed things in the world. Before him, on the huge oaken conference room table, sits a yet-to-be-unveiled Macintosh computer.

"And have you seen the latest Sony Walkman?" Steve Jobs asks. The journalists sitting around the table nod with a show of rapt attention, but their eyes keep drifting to the unopened brown canvas carrying case. "It's amazing—only about that thick," Jobs says, holding his forefinger and thumb in a gesture of measurement. "The limit was how thin they could make the cassette drive mechanism."

Only a few years ago, the idea that millions of people would walk around listening to high-fidelity music coming from a package the size of a cassette tape would have seemed a bit strange. Now Jobs is speaking glowingly of the design of the new Macintosh, and the parallel is drawn: He thinks we're going to see as many people walking around with Macintoshes as with Walkmen.

"As good as some of these products have been, we think we're the only company in the world capable of designing the product you're about to see," he says. "Let's not keep you waiting any longer."

Jobs pulls the product of more than four years of his personal leadership out of the bag and plunks it down unceremoniously on the table. He strides around the room to grab a 4″ Sony floppy disk and tosses it so it skips and slides across the table; the indestructible media smacks into what could be mistaken for a sleek portable TV set.

Photos by Lee Youngblood

Burrell Smith, who started in Apple's service department, was head hardware designer on the Mac project.

Jobs talks about automated manufacturing being integral to the design of the machine, a key element in Apple's strategy to keep the price of Macintosh low enough to spur demand. The Macintosh plant on the outskirts of Silicon Valley can churn out as many as a million Macintoshes a year, Jobs says proudly, and he's just as proud of the hand-picked Macintosh team: He calls them the most talented design group in the industry. "There's no question in my mind when I look at the motherboard of this machine and all it can do. As good as Woz is, our digital designer, Burrell Smith, is better. He's the best in the world."

The best in the world

Apple is one of the few personal-computer makers that could mount a project technically challenging enough—and esthetically inspiring enough—to bring the talent of Burrell Smith into complete bloom. But first Smith had to be discovered. He had first stumbled into Apple in the winter of 1979. Burrell, then unemployed, was driving around in his beat-up white Chevy van, wondering where his next dollar was going to come from, when he drove by one of the first Apple buildings to sprout in Cupertino. He remembered the name. He then applied for a job at Apple and got one—in the service department.

Smith's main qualification was that he had been a member of the Home Brew Club back in the carefree days of 1976. Then Apple Computer consisted entirely of Steve Wozniak and Steve Jobs, and the personal-computer industry was largely represented by a bunch of hobbyists who got together once a month to talk about the neat computers they had built or were designing. Burrell remembered handling one of the first Apple circuit boards, which still smelled of flux, solder, and Jobs's garage. He didn't know yet just how good Wozniak was, no more than the people at Apple knew what they had when Burrell first walked in the door.

"I didn't see Woz much, but I got to know him by working with his boards," says Smith of those months at Apple before his discovery. Even now, as head of the design team, in his baggy Macintosh sweatshirt and faded blue jeans, his

This Macintosh, this new product, is more than just another computer.

where Apple asserts computing is heading?

The decision about whether or not to take up the Macintosh challenge remains a tough one, because there's no getting around the radical differences in the machine's design. But Apple's concept of Volkscomputing is hard to argue with: Macintosh is a small, 21-pound computer that takes up less space on a desk than a pad of paper. Its features include:

- A 9″ black-and-white monitor with 512 by 342 dot resolution,
- One built-in 3½″ Sony microfloppy disk drive,
- 128k of RAM,
- A built-in clock/calendar with battery backup,
- Two high-speed serial ports,
- A typewriter-style keyboard,
- And a mouse pointing device in lieu of cursor control.

It's a risk to opt for a computer that has only one disk drive when everybody else's has two, and you leave the safety of current standards behind with the non-expandable RAM and the 3½″ diskettes. At the machine's demonstration, Jobs and

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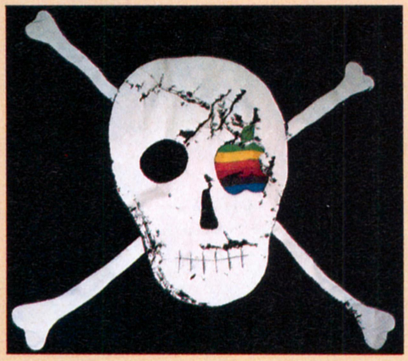
blond hair tucked back around elfin ears, Smith still *looks* undiscovered. "I don't know if you realize just how good Woz's boards are," he continues. "The Apple II 16-sector disk controller board is a work of art, poetry in electronics."

It was Bill Atkinson, who joined the Mac team after playing a key role in the development of Lisa, who stumbled on Burrell down in the service department. It was fairly early in the Lisa project, and Atkinson was spending a lot of time there because that's where tests were underway on the new, 16-sector disk controller. The Lisa team needed its extra capacity to get the whole Pascal-based development system on one disk, but the error rates of the early production units were unacceptable, and everyone suspected a flaw in the controller. Burrell helped Atkinson poke through the test printouts and impressed him with how fast and well he had learned the new controller; when Burrell said the problem had to be elsewhere, Atkinson believed him. The problem turned out to be an undocumented change in the motor made between the development of the prototype and actual production.

Atkinson recognized Burrell's almost mystical affinity with circuitry, his deep understanding of the sleight of hand with which Woz had packed so much function, given the parts available, into the Apple II's boards. Atkinson got Burrell onto the Mac design team. Christmas vacation was coming, and by the time it arrived Burrell knew enough about the Lisa's user interface and the design goals of Mac to be bubbling with electronic poetry of his own. The first iteration of Macintosh, a wirewrapped board built around a Motorola 6809, was finished in Burrell's garage before the first of the year.

Smith doesn't talk about individual achievements when you ask him what it was like to work on the Macintosh project: He talks about group synergy with an almost evangelical fervor. "I don't think there's another company like this in the world," Burrell says. "Any place else, if I had brought that first Mac in, maybe 3 months later somebody from software would have gotten back to me with five reasons why they didn't like it and couldn't do it. Here they say, 'Wow, new hardware!' The day after I brought it in and gave a note to Andy Hertzfeld about the graphics interface, he called me over and showed me Donald Duck waddling across the screen saying 'Hi Burrell.'"



Nicknamed "The Pirates," Mac developers ransacked Apple and the industry to put together the Macintosh.

Burrell Smith was made head of the digital design team and the decision was made to switch from the 6809 microprocessor to the more powerful Motorola MC68000. As Burrell honed his design, he moved more and more to the exceedingly difficult and correspondingly powerful medium of Programmed Array Logic (PALs) for the 68000's support circuitry. When he approached the point of perfection—that is, when he was satisfied he had gone as far as he could with his basic approach without resorting to endless tinkering—he threw the design away and started again. Each design got smaller, until on his fourth try it was small enough. He had packed 70 percent of the function of Lisa onto a board smaller than a sheet of notebook paper.

To get an idea of how much power that is in how little space, compare the Macintosh board to the electronics of the 8088-based IBM Personal Computer. To begin, the MC68000 around which Macintosh is built processes twice as much information per instruction—it communicates with the outside world 16-bits at a time, internally 32-bits at a time, compared to the 8088's 8-bits internal/16-bits external—and executes nearly twice as many instructions per second as the 8088.

Basically, then, the board fulfills Steven Jobs's dream, a dream compelling enough to draw Wayne Rosing into Apple as general manager of personal office systems, to help lure Apple President John Sculley from Pepsi, and to push Burrell Smith to incredible design heights. The dream was to cram the function of Lisa into an inexpensive computer the size of a notebook. Given the lower power requirements and higher density of the next generation of silicon chips, plus a suitable flat panel display, that dream will become reality.

The dream was important enough to Jobs that he had his fingers in every-

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others from Apple tried to explain why these differences aren't important even in today's world, but words failed them. "You've really got to see it," they kept saying. They were right.

First, there's Macintosh's size. If you take a legal-size notepad and stand it on end, Mac—what everyone at Apple calls it—is about that big when seen head-on, and it's less than a foot deep. When it's sitting on a desk, the computer occupies only slightly more room than a standard, 8 1/2″ by 11″ notepad, although room will be needed for the keyboard and the mouse. Turn on the power button, and the screen shows you a little drawing—an icon—of a diskette with an arrow below it. "Aha!" you think, "It wants me to insert a diskette!" When you put a diskette into the drive slot—there's no door to close—a soft whirring that can only be heard in a quiet room tells you the disk is loading. The Sony diskettes are encased in hard plastic covers—you could play Frisbee with them without worrying about damage—and

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thing, including the 1982 Macintosh group Christmas party. By the time he had finished planning it, it was way over budget. Another person might have lowered his expectations, but not Jobs. He asked two other divisions at Apple to throw in with the Macintosh group so they could afford the party as planned. The groups turned over their budgets without hesitation when Jobs told them he was going to rent the main ballroom at the St. Francis, one of the finest hotels in San Francisco. The location confirmed what was implied by this being a Macintosh party: It was going to be the best.

The Macintosh crew resisted when Jobs told them they had to dress up for the event. "But Jobs made us go," says Atkinson, who was solidly with the rest of the Mac team in favoring shorts, T-shirts, and blue jeans. Grey-striped suits and white shirts were what you wore to a funeral. "He told us to take this thing like a joke, like it was Halloween, and that made it OK. It became like designing costumes; the only way to do it was to go all the way."

As the normally motley Mac crew arrived and stopped by, one by one, to say hello to Steve and singer Joan Baez, his date for the evening, it became apparent that Jobs had successfully solved his first problem for the evening: They were all wearing tuxes or tails, although a few had retained their sneakers. Job's second problem had to do with the 30 members of the San Francisco Symphony he had hired to play his favorite music: waltzes. It was a gamble not unlike the gamble he was making with Macintosh: Could he get his masses to try something new? Because he had taken pains to create an enchanting environment, because he opened up the wonders of the waltz by making it extraordinarily easy and painless to learn—he had arranged waltzing lessons for the entire party—the evening was a smashing, three-quarter time success.

Keeping Mac lean and mean

Jobs was guardian of the faith for the Macintosh group, devoted to keeping it ambitious, closeknit, lean, and mean. He gave the group its motto: "It's better to be a pirate than to join the Navy." What it meant, say members of the design team, is that the group was supposed to swoop down fast, steal the best, and leave the rest. Jobs, as chairman of the board, had enough pull to give the group the right to pillage anything of interest inside Apple, but the pirate attitude extended outside the company as well. When Jobs asked the pirates to help him raid another company, the team responded almost overnight with special demo software that may be the most impressive exploitation of Mac's capabilities to date: It's an animated display of tumbling Pepsi bottle caps, and insiders say it was what clinched John Sculley's decision to forsake Pepsico's battle with Coke in favor of Apple's battle against IBM. Apple still shows it to companies it hopes to convince to develop software for the new computer.

The chairman's baby

"The most obvious thing *within* Apple that we leveraged off of, on the other hand, was Lisa," says Andy Hertzfeld, the second software person to join the Macintosh project. "And the most important thing we took from Lisa was Bill Atkinson."

Bill Atkinson created Quickdraw, the elegant core of Lisa's sophisticated graphics and windowing capabilities, and thereby defined Macintosh. "One reason we started the Mac project was that Quickdraw was so super neat," explains Hertzfeld. "We just had to have another computer to run it on, a machine that would really get it out to people." No matter how incredible the software technology was, they knew they had to make it cheaper. The goal was for Mac to have 70 percent of Lisa's capability at 20 percent of the price.

"Fortunately, we learned a lot building Lisa," says Atkinson. "Although the Lisa project started small, it became an exploration of what could be done. The Mac team was different. With Mac we had a definite goal. Instead of arguing over what to do, we helped each other with how to do it."

Atkinson had done Quickdraw and the user interface for Lisa; he did it all over again for Mac. "When you get to the point where you have a work of real beauty," he explains, sounding a familiar Macintosh theme, "the best thing to do is throw it out, because your next version will be smaller and cleaner."

It became a standing joke that with every feature Atkinson added to Mac's Quickdraw, the smaller it got. Atkinson was doing some amazing compressions of Quickdraw's algorithms. To tighten things up even further, Hertzfeld hand coded Atkinson's Pascal into 68000 assembly language, a tortuous task that requires converting Pascal's English-like commands into the gnarl of 0s and 1s that a computer understands. Even then, says Atkinson, "We had to start wondering about how many of the features would fit in the damn ROM." Whereas on Lisa the software designers

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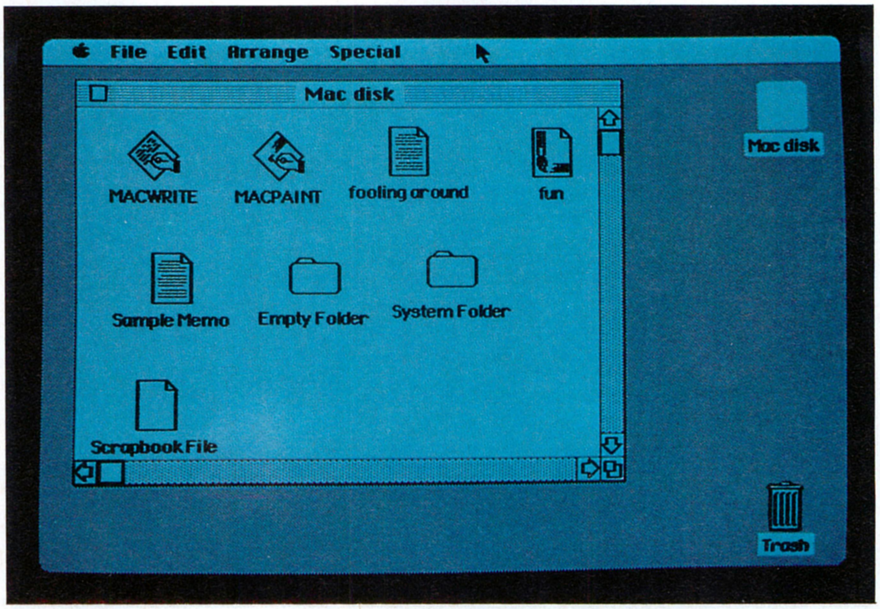
(continued from page 61)

they're small enough to fit in your shirt pocket. You'll also be able to give up paper disk sleeves and sticky write-protect labels, because the Sony diskettes don't have either. The hard case makes paper sleeves pointless, and there's a little red lever on the case itself that you can move to write-protect the disk.

The screen measures only 9″ on the diagonal, but you'll forget all about the smaller size when the computer comes on. This display is so sharp and clear that you'll forget you're looking at a computer. It looks *cooler* than a standard green or amber display, and you won't find yourself squinting as much to see details because everything's so sharp.

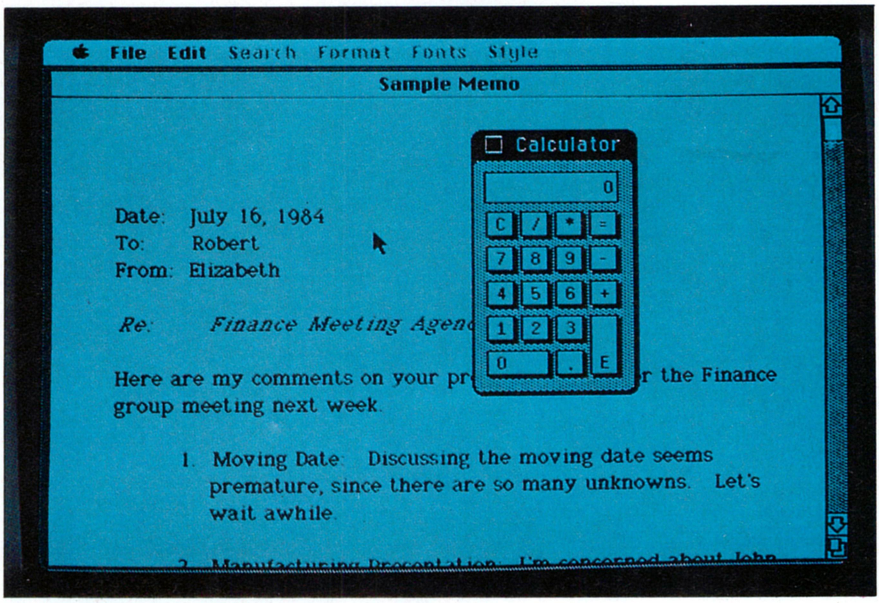
After the disk is loaded into Mac, the display shows a tiny icon that looks like a diskette, and another one that looks like a trash can. There's also an arrow, which is the pointer for your mouse. The mouse is a small beige box which is connected to the back of Macintosh with a thin cable. It's about the size of a pregnant cigarette pack, and has a button on its top and a big ball bearing underneath it. You push it around on your desk to move the arrow, which is used to select icons and commands from the menus.

Initially, the mouse concept takes some getting used to. You don't look at the mouse as you roll it; you look at where the arrow is moving instead, which may create some minor problems. For instance, you're rolling the mouse and watching the arrow move on the screen, and before you know it you've rolled the mouse off the edge of the desk or up against your stapler. For the first few minutes, your eye is glued to the arrow on the screen, and while moving the mouse your hand smacks into the stapler, the tape dispenser, or the telephone. The mouse needs room to roll, so rearranging a few objects so there's about six or eight square inches of clear desk area takes care of the problem.



Assuming you've given the mouse some room to move, though, it quickly becomes a transparent part of the computer's operation. You don't *think* about moving the mouse, or even about moving the arrow to a certain place anymore than you might think about moving your hand toward a door to push it open. Instead, you think about going through the door. Move the arrow to an icon and click the button on the mouse, and

Above: Macintosh uses icons to represent functions and files which you select by using the mouse controller. Below: The Desk Accessories feature activates a menu which lets you access a working graphics calculator with mouse-controlled keys, a notepad, a scrapbook, an alarm clock, and other tools.



Date: July 16, 1984
To: Robert
From: Elizabeth

Re: Finance Meeting Agen

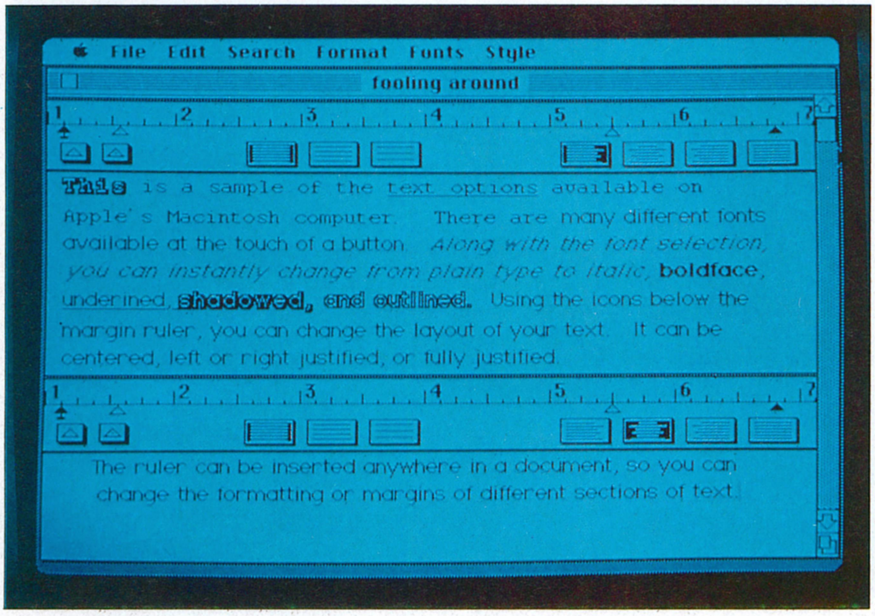
Here are my comments on your pr r the Finance group meeting next week.

1. Moving Date: Discussing the moving date seems premature, since there are so many unknowns. Let's wait awhile.

2. Manufacturing Presentation: I'm concerned about John

Photos by George B. Fry III

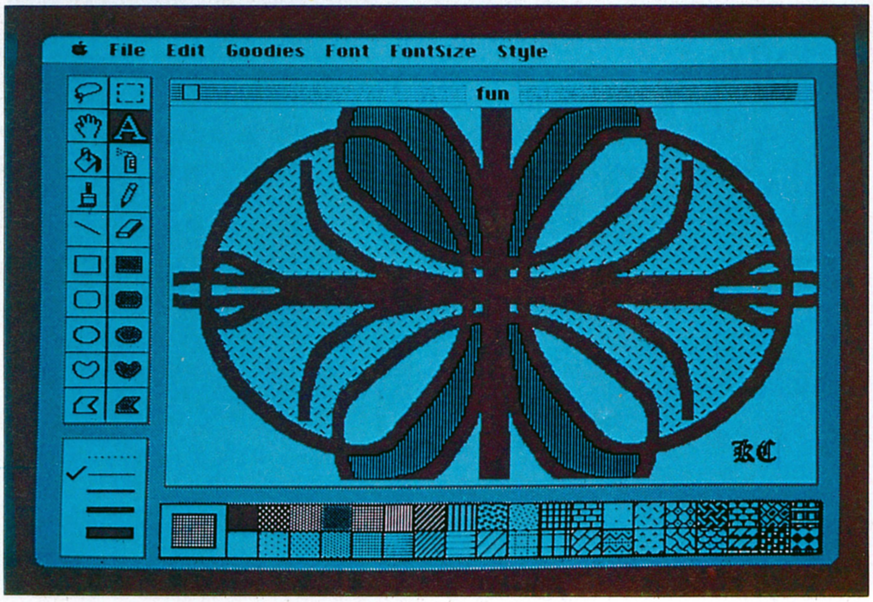
Macintosh allows us to forget about the physical computer and concentrate on our computing.



This is a sample of the text options available on Apple's Macintosh computer. There are many different fonts available at the touch of a button. *Along with the font selection, you can instantly change from plain type to italic,* **boldface**, underlined, shadowed, and outlined. Using the icons below the margin ruler, you can change the layout of your text. It can be centered, left or right justified, or fully justified.

The ruler can be inserted anywhere in a document, so you can change the formatting or margins of different sections of text.

Apple is offering MacWrite (a word processor) and MacPaint (a graphics program) on one disk for $99. ABOVE: MacWrite features on-screen formatting and a variety of type font, style, and size selections. BELOW: MacPaint makes stunning free-form graphics capabilities available to even the most unartistic users.



you've selected that icon. This is how everything works with Mac: You see it, point to it, click the button, and get it. The icons represent diskettes, files, groups of files, even areas of Mac's memory. If you want to show the contents of a diskette, you simply select the diskette.

When I point to the diskette icon and click the mouse button, a window expands out of the icon and fills part of the screen. Inside the window are more icons, representing individual files and applications programs stored on that diskette. To open a file, I point to the icon and click, and another window fills the screen to show the contents of that file. The icons are different (a graphics file icon will have shapes on it, while a text file icon will look like a miniature page of text), and each has a file name beneath it. You don't have to remember the file name and type it in to retrieve a file; you simply select it with the mouse.

Spreadsheets: Are they limited?

The mouse and the windows, both exponents of Lisa technology, are the keys to Mac's ease of use. Without having learned a single keyboard command, I'm quickly inside a Multiplan worksheet, widening columns, replicating formulas, and even copying cells to other worksheets. Here's how: Inside the window that opened when I selected the diskette icon, there's an icon labeled, "Multiplan Worksheet." I point to it and click the mouse button, and another window zooms out of that icon to fill the screen. In the window is a Multiplan spreadsheet. The name of the file is displayed across the top of the window. At the bottom of the screen, below the Multiplan window, I notice that another icon has appeared: a clipboard (I'll get to this in a minute).

On a normal computer, I would have had to load Multiplan separately from its program disk, issue a command, and type a file name to load the spreadsheet data from a data disk. The easiest way to do that would be to have two disk drives—one for the program and one for the data disk. With Mac's 400k microfloppy, though, there's plenty of room on the same disk for the Multiplan program and several worksheet files. The high-capacity drives (we were told that Mac's microfloppy will soon be upgraded to 800k capacity) enable Macintosh's operating system to do its magic. While you have to load,

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173-024

program and data files separately on other computers, Macintosh automatically loads the program and data file together. When you choose a spreadsheet file, it knows that it should load Multiplan. If you choose a text file, it knows to load the word processor. And if you want to create a new file, you simply choose the icon that represents the program by itself.

If I try making a column on the worksheet wider, say, from eight to 10 characters, I move the mouse pointer to the column dividing line, click the button to "grab" the line itself, and "drag" the line to the new location. You see this happen instantly on the screen, so you just move the pointer until the column looks wide enough. All the columns to the right of the cell you widened automatically move over. The process takes less than five seconds. On a "standard" computer running Multiplan, the process goes more like this: You type F (for Format), W (for Width), 10 for the number of characters, and then another number for the area of the worksheet you want to modify (column 4, let's say). That's

APPLE BITES BACK

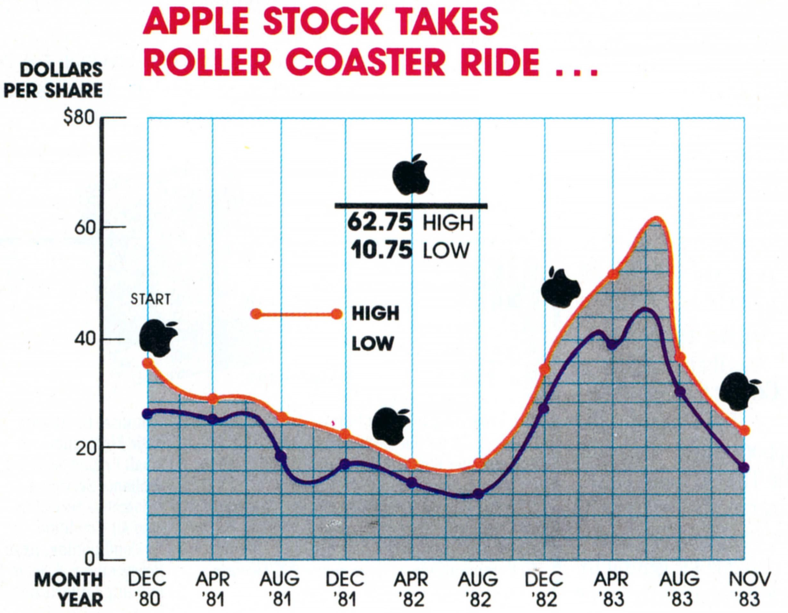
Is Apple Computer in trouble? Stunned by the personal-computer industry's shakeout, IBM's thunderous success, and admittedly serious errors in marketing its Lisa, Apple Computer's profits fell far below expectations at the end of the last fiscal year, which closed in September. As a direct consequence, the company's stock price collapsed: From a high of almost $63 a share in June 1983, the stock tumbled to only $17.75 at one point in November.

But it would be a mistake to read from the market's vagaries that Apple is a company in trouble. Certainly, Apple faces tremendous challenges, ranging from IBM's relentless marketing pressure to the impending entry into personal computing of another colossus, the new AT&T. And it is highly unlikely that Apple can maintain its spectacular growth rate, which was 40 percent in the last fiscal year and an average 107 percent over its five-year history.

Apple instead is going through growing pains crucial to shaping its future. Among these are: cutting back employment to 5000 for 1984; investing heavily in capital equipment, which is depressing profits; and redesigning its existing products so they work together more completely.

Cash-rich, Apple has invested $20 million in a highly automated factory, which was designed from the ground up specifically to turn out Macintosh, the company's newest personal computer. Production started in November, with capacity expected to exceed 80,000 computers a month by the end of 1984, according to Apple chairman Steve Jobs.

"Mac *is* the future of Apple," Jobs told *Personal Computing* during interviews that led to this month's cover feature. Three meanings can be read into Jobs's comment: Most obviously, Apple is counting heavily on sales of Macintosh and its peripherals to furnish the company's growth. Stability and cash come from sales of the Apple IIe, which remain steady at 50,000 a month according to several estimates. These sales are fueled by the largest base of applications software available for any personal computer. Particular emphasis is being put on the educational market, which now accounts for 25 to 30 percent of the IIe's sales, according to Daniel Lewin, Apple's educational marketing manager. More vertical markets are served by the Apple III, now selling at about 10,000 per month. Sales of the Lisa 2, an improved version of the powerful computer that introduced the world to the concept of integrated software, windows, and mouse technology, are difficult to predict. The new unit should do better than the current Lisa, which has an installed base of about 30,000. But it is Macintosh that will supply Apple's growth; a number of observers project sales of



Stock prices represent expectations—and the ability to fulfill them. Apple soared to $63 and back down to $17.75 in a few short months during 1983. Per-share price hovered around $20 for most of the balance of the year.

Diagrams by Geibert, Source: Dow Jones News/Retrieval Service

Once you learn to use the mouse, it quickly becomes a transparent part of the operation.

five keystrokes and about 10 seconds by the time Multiplan's subcommand menus change. But what's amazing is that while I would have had to spend perhaps half an hour thumbing through a manual just learning how to make this change on a standard computer, it's intuitive on Macintosh—you see, you point, and you do.

Many other Multiplan functions are just as easy. To copy a value from one cell to another, just point to the first cell, click the button, point to the second cell, and it's done. Naturally, you can't do *everything* in Multiplan by moving the mouse, but you can do most things. You still have to type in labels, values, and formulas, but when it comes to putting them in the sheet, specifying areas of calculation, formatting, or copying the worksheet file, you just point and click. These commands are available on a pull-down menu under a label in the menu bars above and below the actual worksheet. If you want to move to a distant cell quickly, you can still use the Go To command from the key-

(continued on page 72)

500,000 units in 1984, while Apple will only openly state that it expects Macintosh to rapidly become the fastest selling personal computer.

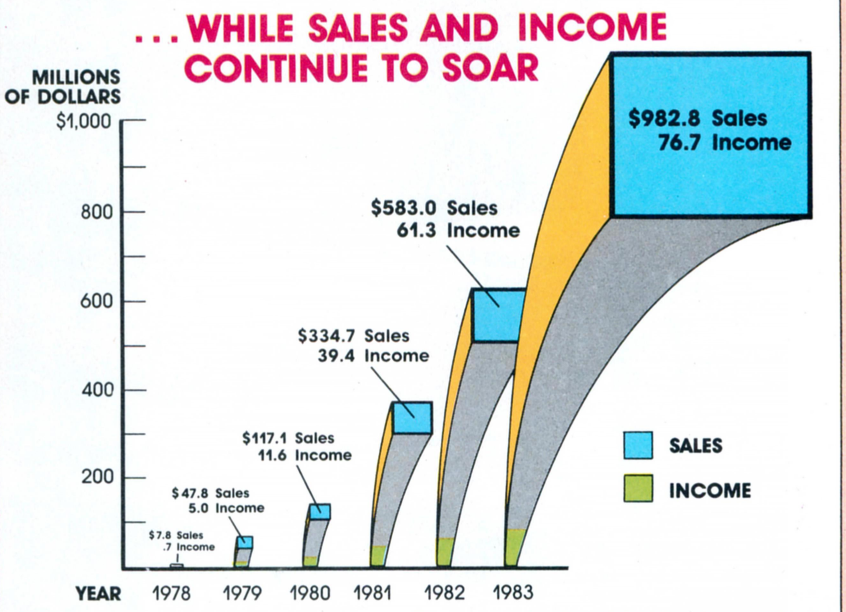
In the longer term, Jobs's statement implies that Mac is the forerunner of future Apple products. Or more accurately, Lisa-style software and operating environments will be put in a variety of products as technology evolves.

Finally, in financial terms, Macintosh represents Apple's evolution to mass production, a shift that is essential for the company to remain competitive. Not only will the computers be turned out on a highly automated assembly line—one unit every 27 seconds, Apple says—but Macintosh and its factory were designed together. Jobs aims to be this industry's Henry Ford: He intends to bring mass production to personal computers, which will enable millions of people to afford to enter the era of personal computing. This explains Macintosh's one-size-suits-all philosophy. While other companies offer ever-increasing expansion capability, Apple offers none. Like Henry Ford, who offered the Model T in any color you wanted, as long as it was black, Apple offers the Mac in any configuration you want, as long as that means 128k of RAM; a windowed operating environment in 64k of ROM; and a single, internal disk drive. In return for giving up hardware flexibility, you get remarkable performance for the price.

Will this philosophy work? Analysts who track the personal-computer industry for financial institutions and investment firms, such as Greg Kelsey from Hambrecht and Quist, a leading high-technology venture capital firm, and Peter Wright from the Gartner Group, Inc., seem bullish on Apple's prospects. They all agree that Apple is on its way to solving its problems.

IBM has a hammer-lock on the Fortune 500 market, where IBM has a strong reputation, leverage from its mainframe sales, and the advantage of having more salespeople than Apple has total employees. Yet Apple has already landed a major contract to supply large quantities of Macintosh computers to a Big Eight accounting firm.

Ultimately, the consumer will decide. With its emphasis on Lisa-style technology—incorporating pull-down menus and mouse technology—Apple is challenging the consumer to rethink personal computing in much the same way the company challenged people when it originally introduced the concept of personal computing to a skeptical world only nine years ago. If the consumer accepts Apple's vision of how computers should be used, and recognizes Macintosh as setting a new standard in value and performance, Apple will have succeeded in raising the entire industry to a new plateau.



Sales and profits have increased steadily at Apple; fiscal 1983 sales reached $982.8 million, up 67 percent from 1982, and net income rose 25 percent to $76.7 million—extremely high growth for a nearly $1-billion-a-year company.

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The VisiCalc IV program is a brilliant refinement of a program originally called "VisiCalc"—the world's first electronic spreadsheet.

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If VisiCalc IV did nothing more than let you enter figures on a computer screen and get them perfect before you pushed "Print" for your hard copy, it would be a blessing.

But that would ignore the fundamental power of the VisiCalc IV program. Not only does it do all your intermediate and final calculations automatically, it also lets you experiment with an endless number of variables at the touch of a key.

For example: if you want to ponder what effect a $.02 increase in the cost of, say, galvanized screws would have throughout your work, simply enter $.07 where $.05 used to be. Behold! Every number everywhere in your work instantly changes to reflect the increase!

The fact is, a lot of important financial questions never get asked because no one wants to do the tedious work necessary to answer them. And "What if?" oh so quickly becomes "What now!!"

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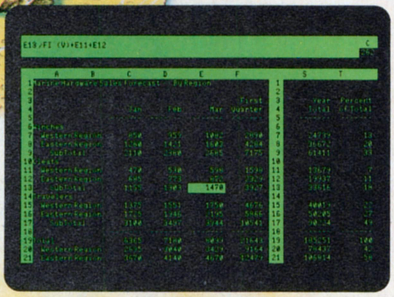
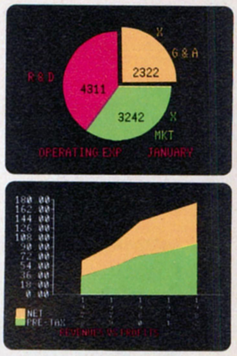
Our original VisiCalc has been the best selling business program in history. But VisiCalc IV is even better.

Among a host of other things, graphics have been added. This allows you to command the computer to turn your numbers into eight different kinds of charts and graphs (black and white *or color*).

VisiCalc IV even makes the *computer itself* easier to use. Simple instructions reduce learning time to hours, instead of days. We also offer a tutorial program called VisiTutor that will take a hesitant beginner from the basics to advanced applications that were once only the province of veteran VisiCalc users.



But, you may wonder, what would happen if we improve on our new VisiCalc IV and come out with VisiCalc V?



No problem. You simply *trade in* your VisiCalc IV and receive your *original purchase price* as credit towards the new program, minus a nominal charge to cover the cost of the new materials that accompany it.*

This means that when you buy VisiCalc IV, you will never lose your original investment.

IN ONE HOUR, YOU CAN DO A DAY'S WORK. IN ONE DAY, YOU CAN DO THE IMPOSSIBLE.

VisiCalc IV is truly a heavensent business tool. Working without it is like walking across town without shoes. You'll get there. But it won't be pleasant.

Visit your nearest computer showroom and ask to see VisiCalc IV. You'll find it a wondrous revelation.

And should, by chance, you encounter some "VisiCalc-like" program, ask about *their* trade-in policy. Ask for a side-by-side, feature-by-feature comparison.

Then ask again.
For VisiCalc IV.

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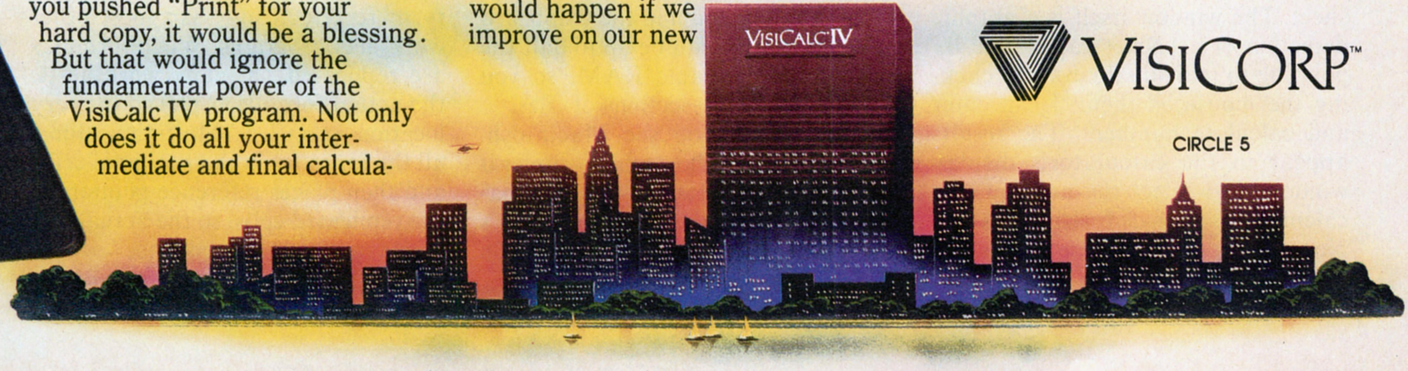
*Naturally, VisiCalc owners will be welcome to upgrade to VisiCalc IV as well. VisiCalc IV is available for the IBM PC and IBM XT. The words "VisiCalc IV" and "Visi On" are trademarks of VisiCorp, San Jose, California.

TO ANYONE WHO'S MOMENTS AWAY FROM BUYING A COMPUTER:

No doubt you're already considering an electronic spreadsheet and are acutely aware of VisiCorp's revolutionary Visi On™ software system.

Before you make any decision, you should know that VisiCalc IV is a tremendous improvement over standard VisiCalc. Four new features increase its usefulness manyfold. There are *Business Graphics*. Capabilities for *Sorting*, alphabetically or numerically. *Rearrange* for quick summaries. And single keystroke *User Programmable Function Keys.*

Taken together, these improvements make VisiCalc IV your logical choice. But in addition, if you buy VisiCalc IV now, the purchase price of $250—minus a new materials charge—can be applied to Visi On Calc™ And that makes VisiCalc IV your only choice.



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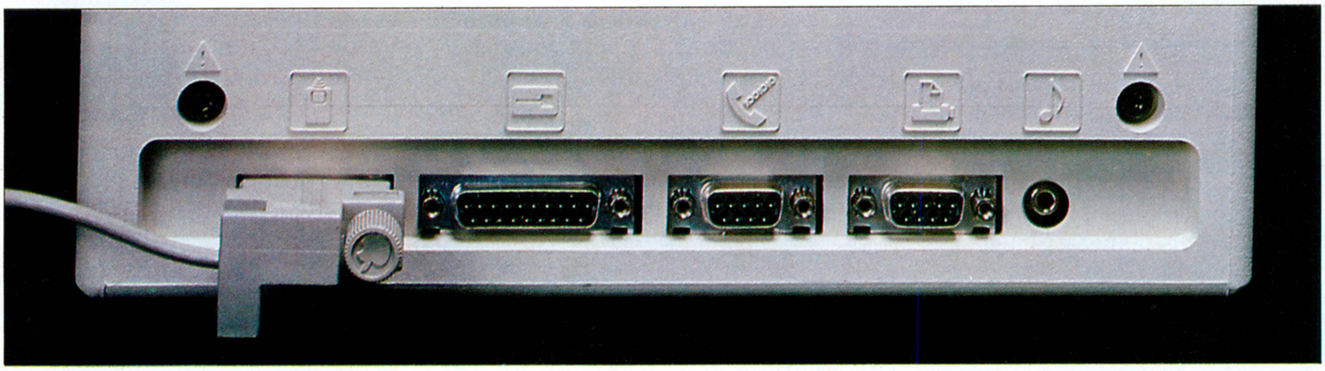


Offering a simplified approach to interfacing, the rear panel of the Macintosh has five built-in interfaces (from left): the mouse controller, an external $3\frac{1}{2}''$ microfloppy disk drive, two high-speed serial ports for modems or printers, and a 4-channel sound connector.

(continued from page 69)

board, but there's a simpler way. The border of the window has arrows at each corner. There's a little box below or beside the arrows at the upper right and lower left. If you want to move down several rows at once, you use the mouse to "grab" the box at the upper right, and "drag" it down the side of the window. The total distance the box can travel from top to bottom represents the length of the worksheet. To move to the middle of the sheet, drag the box to the middle of the window frame. To move to the far right edge of the worksheet, drag the bottom box from the left side of the window to the right.

There are a couple of special features in the Macintosh operating system that are available with any applications program. At the left of the menu bar, there's a small apple icon. When I select it, a pull-down menu with the heading Desk Accessories appears. I see labels for a calculator, a notepad, a scrapbook, a clock, and other desk-like items. I select the calculator, and a window opens over the middle of the worksheet. The window itself is a graphic depiction of a pocket calculator. By pointing to individual keys and clicking the mouse on them, I can enter and calculate numbers. The results appear in the calculator's display window. If I select the notepad, the calculator is replaced with a graphic piece of paper, and I can type short notes on it. The clock accessory allows me to set an alarm that can remind me of appointments even though I'm in the middle of a program. When you put the accessories away, you're automatically returned to the file you had open before. When combined with another Macintosh function called the Clipboard, the accessories can be quite useful.

The Clipboard is a memory buffer in which you can temporarily store information copied from an open file or desk accessory. If you're working on a spreadsheet, for example, and you need to add up a number, you can get out the calculator, figure out the number, and copy it to the Clipboard. Once the number is in the Clipboard, you can copy it back into the worksheet where you want it. The Clipboard appears as an icon at the bottom of the screen. To put something into it, you select it (point to the display window in the calculator to get a number, for example), and then drag the selection to the Clipboard icon. To paste the number in, you pull it from the Clipboard to a cell on the worksheet. You can only store one piece of information in the Clipboard at a time, but it can be up to half the size of the available RAM, so you could copy whole sections of files.

The minute you see Macintosh, you'll appreciate how much simpler it makes spreadsheets, but you'll probably wonder whether the computer's fixed 128k RAM isn't a limitation on its usefulness for spreadsheet work. The answer, of course, is that you can get a much bigger worksheet into the RAM on a 256k computer than you can on a 128k Macintosh, but Apple insists that this won't matter to most users. According to Joe Shelton, software product manager for Macintosh, "Macintosh will handle 90 percent of the spreadsheets people do." According to studies done with Apple II and III users, he says, "The average user's worksheet occupies a maximum of 20- to 30k. Multiplan on Macintosh will offer 50k of worksheet space." He adds that even with the largest spreadsheets, Macintosh users can take advantage of the naming and consolidation features of Multiplan to link several sheets together. "Most people like to break up the huge spreadsheets anyway, so they can work on them more easily," he says. "You'd probably have, say, one each for Sales, Cost of Goods, Fixed Expenses, Variable Expenses, and so on, and then bring the key values into a consolidated worksheet."

In addition, Multiplan uses memory more effectively than most other worksheet programs. When formulas are replicated on many worksheets, the actual formula is placed in every location specified. Multiplan stores all the formulas in their original cells, and then places reference pointers in the replicated cells, so the actual formulas are only stored once.

The mouse and the windows, the exponents of Lisa technology, are the keys to Macintosh's ease of use.

INTRODUCING THE NEW LISA 2

Submerged in the hoopla surrounding Apple's Macintosh computer is the introduction of Lisa 2. This new computer is an improved, repackaged version of Apple's Lisa.

Lisa 2 was introduced on January 24, the same day as Macintosh. Bearing the code name Pepsi, the computer reflects the influence of John Sculley, who was lured from Pepsico last year to serve as Apple's president.

When *Personal Computing* saw Lisa 2—literally the day after the first engineering model had been put together—the first thing we noticed was the single, small slot for inserting microfloppy disks in the front of the machine's main unit. The two high-capacity $5\frac{1}{4}''$ disk drives that Apple built for Lisa are gone. Instead, with Lisa 2's single Sony $3\frac{1}{2}''$ microfloppy drive, users can exchange disks with Macintosh users. Actually, while Lisa 2 will run Macintosh software, the reverse isn't true unless Lisa 2 disks are created under Macintosh applications programs.

This reverse engineering simultaneously responds to two of the most stinging criticisms of Lisa: It was incompatible with everything, and it lacked third-party software.

Opening Lisa up to the hundreds of third-party software packages promised for Macintosh is an obvious benefit. One benefit that can't be seen, however, is an improved Winchester disk drive. So Lisa 2 users won't be saddled with the separate ProFile hard disk wired into the machine. Instead, the new Winchester is mounted internally, and with 10Mbytes, it doubles the storage of the ProFile.

Apple also promises that Lisa users will finally get communications capability through LisaTerm (a terminal program), Applebus (the RS-422 port on the back of both Lisa 2 and Macintosh, which allows the computers to be connected to some local area networks), and IrmaLine (a protocol converter box that will enable connections to mainframes and minicomputers).

At this writing, Apple had not determined the price of the Lisa 2, but Wayne Rosing, a general manager at Apple, did tell us that the company was unbundling its software, allowing customers to pick and choose the configuration and applications programs they wanted. This means that a base unit with a Winchester and 512k of RAM could be purchased for somewhere between $5000 and $6000.

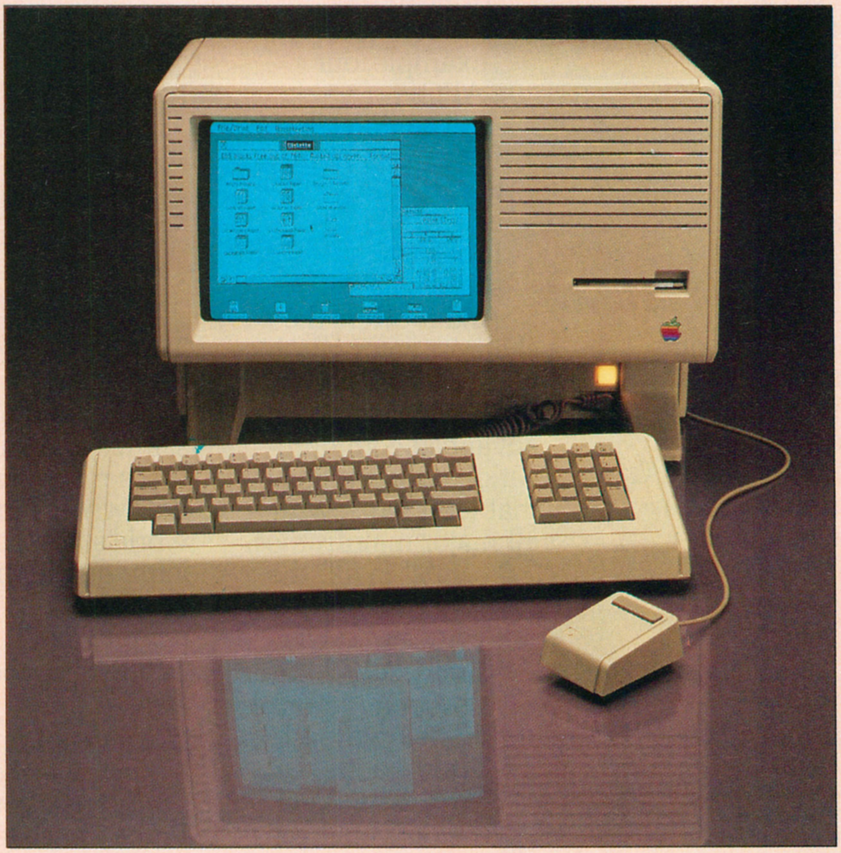
The operating system will be available for about $200, and separate applications packages will cost from $200 to $400.

Since some 30,000 pioneers have purchased the original Lisa, Apple will offer an upgrade program through its expanded dealer network. There are two basic options, one of which is free.

In the base option, a user brings his Lisa into a dealership where the original two Lisa drives are taken out and replaced with a single Sony microfloppy drive. New operating software is furnished that provides some improvement in operating speed. This is done at no cost to the owner; in fact, Apple directly compensates the dealer for his effort.

In the second option, a user will gain the new 10Mbyte Winchester, installed with the microfloppy drive in lieu of the old Lisa drives. The dealer will also install the complex operating system, which takes up several $3\frac{1}{2}''$ floppies. The combination of the improved software and the faster disk drive gives a refurbished Lisa a full four-fold performance increase. However, this retrofit will cost Lisa owners somewhere between $1500 and $2000.

Additionally, an Apple spokesman says that dealers will be encouraged to allow substantial trade-in value for existing ProFile hard disks, which would help defray costs.



Lisa 2 has replaced Lisa's dual $5\frac{1}{4}''$ drives and separate hard disk with a single Sony microfloppy and internal 10 Mbyte Winchester drive.

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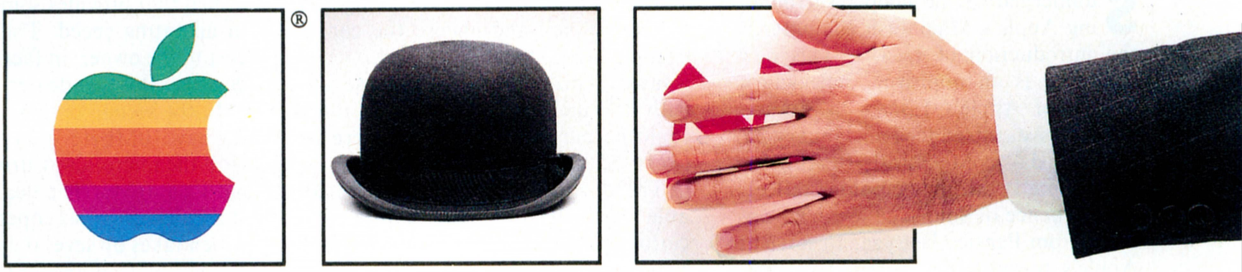

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CIRCLE 105

Apple is well aware of the importance of software in establishing a product.

When I want to move from the spreadsheet file to word processing and graphics, I have to switch to the MacWrite and MacPaint diskette. I close the Multiplan file by clicking a small box on the top of the window. Before Mac will refile the worksheet, it displays a comment box that asks if I want to save the change I made. Boxes marked "yes" and "no" are there to accept my answer. I choose "no." When this window closes, the diskette contents window, with all the file icons, is right where I left it (the newly opened worksheet window actually covered it up, just as a piece of paper would cover another on a desk top). I select the File label from the top menu bar, and choose Eject Disk from the pull-down menu. The diskette window closes, and after a short wait the diskette pops out of the drive. Whenever you have to wait more than a second or two with Macintosh, the mouse arrow on the screen turns into a tiny clock face. Cute.

MacWrite and MacPaint

Next I pop in the MacWrite and MacPaint diskette, which Apple is offering for $99, and repeat the diskette and file-opening steps. The text file looks a lot like it would with other computers, except the black-on-gray screen makes it look more like an ordinary piece of paper than an image on a cathode ray tube. The text appears exactly as it will when it's printed out on paper. You see not only the margins, indents, and line spacing you will get in hard copy, but also the underlining, boldface, and different type faces you may be using. Between using the mouse for text selection and having different type fonts and sizes available instantly, word processing will never be the same. Above the text window in the menu bar are an apple icon and six labels: File, Edit, Search, Format, Fonts, and Style. There are also icons representing different page layouts: Right justified, left justified, full jus-

(continued on page 79)

THE FLOPPY DISK CONTROVERSY: WHICH SIZE WILL WIN?

It has long been accepted that microfloppies—magnetic disks smaller than 4″ across—would eventually replace 5¼″ disks as the storage media for personal computers. And the smaller the disk, the smaller the computer that uses it could be. The question that remains, though, is *which* size microfloppy?

One microfloppy design, a 3″ disk pushed by a consortium of Japanese companies including Hitachi, has never received serious consideration from computer manufacturers in this country, although the Hitachi drive is being used in some Japanese and European machines. Another design, the 3¼″ disk backed by Tabor and Seagate, has also failed to win a major endorsement from computer manufacturers. Even the 3.9″ standard offered by IBM failed to win support—the design was labled inferior by the computer trade press—and IBM withdrew it from the market. This withdrawal ended the speculation that the 3″ disk would show up on the recently introduced IBM PCjr, which uses 5¼″ disks.

It's quite possible that Apple Computer's decision to use Sony's 3½″ disk standard on its new Macintosh personal computer—coupled with Hewlett-Packard's endorsement of the disk—will close the door on competing microfloppy disk designs.

In addition to the disks, the Sony disk drives offer a performance improvement over the 5¼″ disk drives it seems destined to supplant. The higher rotational speed and greater data density of the Sony drives results in a higher data rate, so files will load roughly twice as fast. The Sony-standard drives are also *quiet*. The only way you'll be aware that a program is accessing the disk, in most cases, is by watching the red light on the drive.

SONY
Micro Floppydisk
Single Sided

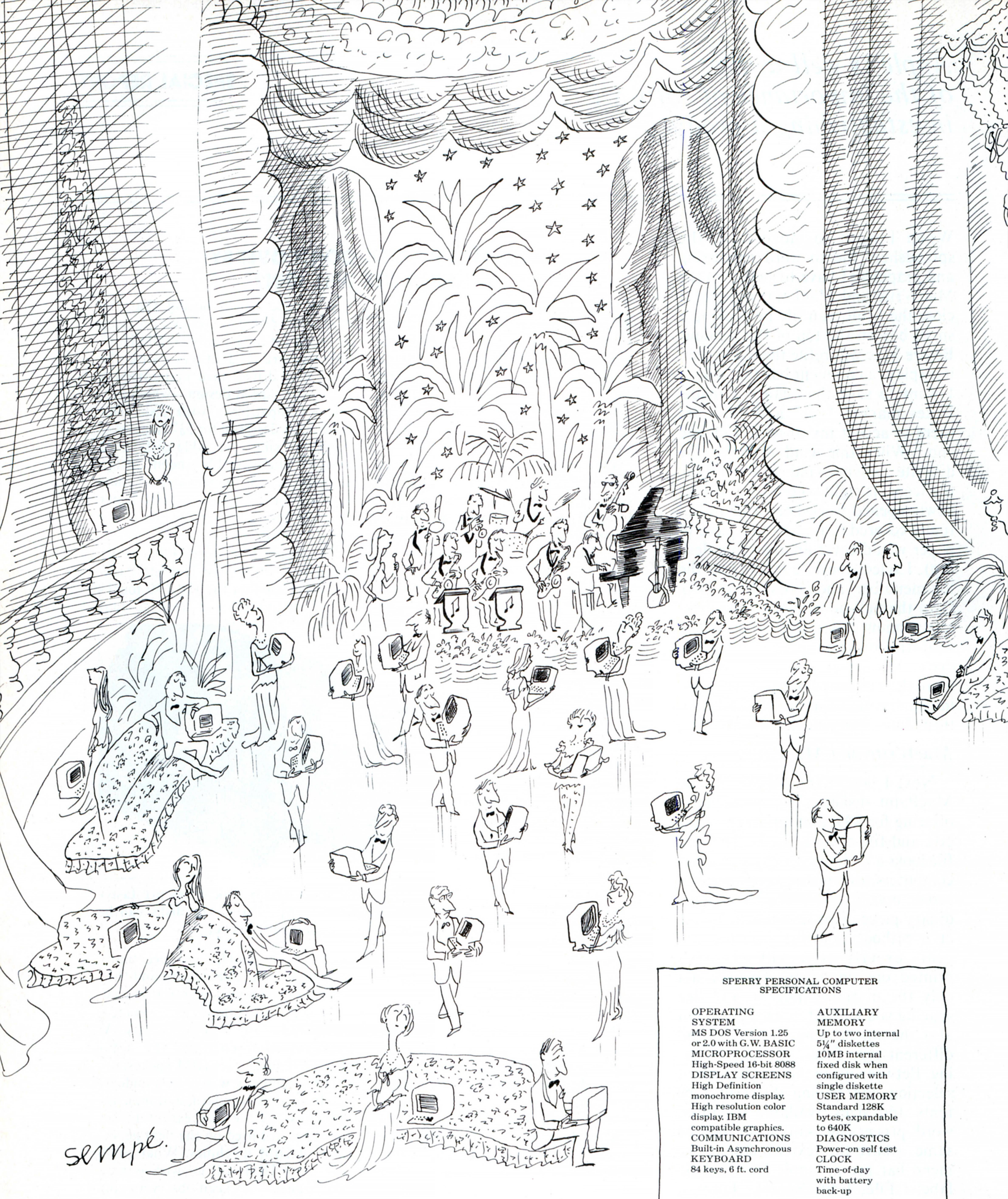
Photo by George B. Fry III

Macintosh's microfloppy disk drives are faster and quieter than 5¼″ drives. The disks can be safely carried in a shirt pocket.

It is also worth noting that the Macintosh disk drive follows the Sony standard for media only. While Hewlett-Packard and others using the Sony disk drives have maintained a steady disk speed design—which preserves compatibility with disk drive controllers designed for 5¼″ floppies—Apple is using a variable disk speed design. The variable speed design compensates for the fact that the outside portion of a disk rotates faster than the inside by varying the motor speed of the drive.

The Apple drive stores 400k, as opposed to 256k for the Hewlett-Packard drive used on the HP 150 touch-screen computer, a difference that should soon double and eventually quadruple as double-density and then double-sided technology is introduced.

So is the microfloppy race decided, once and for all? Not necessarily. At a recent conference for the data-storage industry, an IBM spokesman said his company would soon endorse a sub-5¼″ disk standard, and industry observers say we can expect to see that standard used on the next generation of IBM machines. What small disk drive IBM will go with is anybody's guess, but keen observers note that IBM has yet to follow Apple's lead on anything beyond the term personal computer.



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monochrome display.
High resolution color
display. IBM
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KEYBOARD
84 keys, 6 ft. cord

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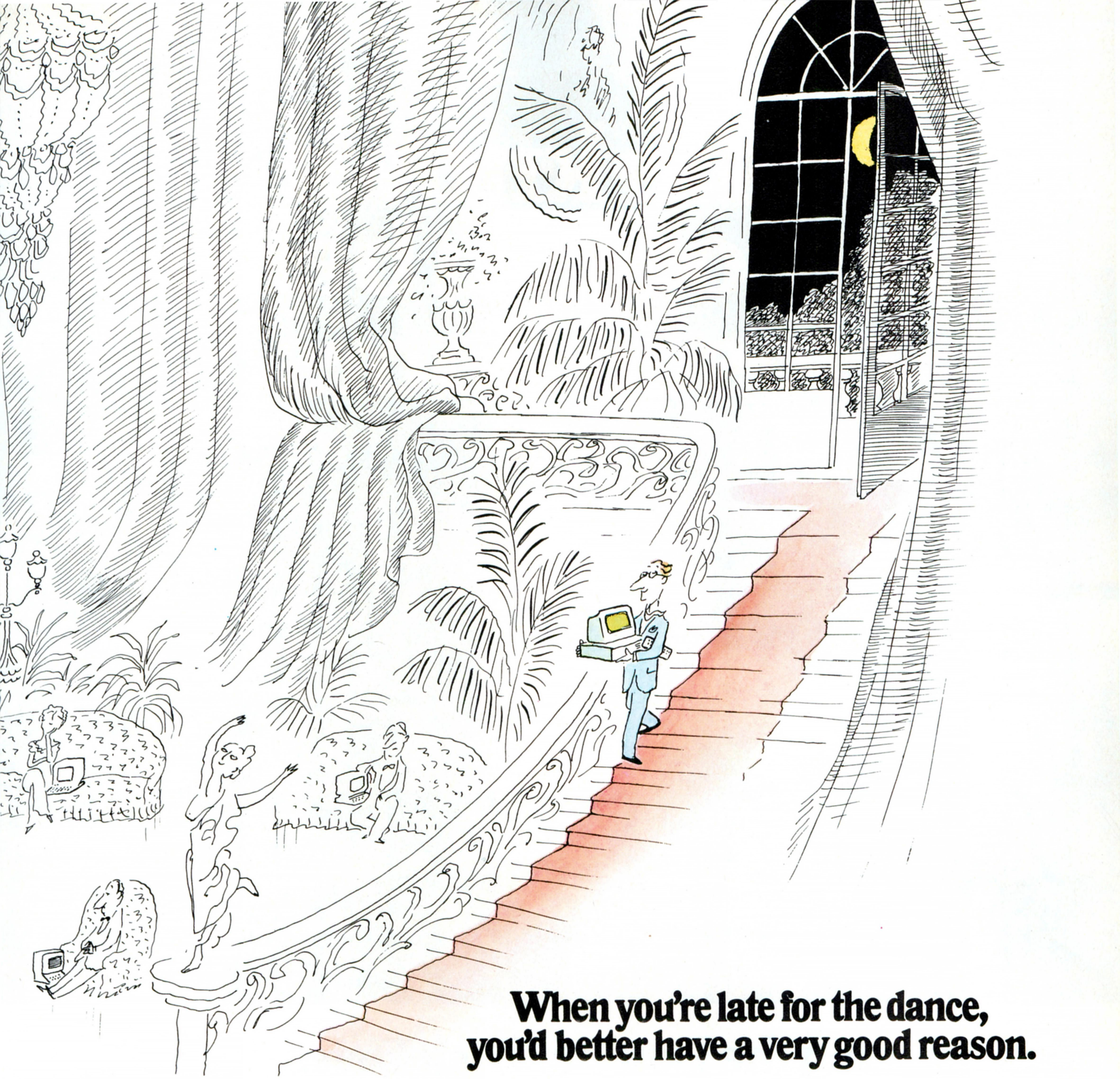
MEMORY
Up to two internal
5¼″ diskettes
10MB internal
fixed disk when
configured with
single diskette
USER MEMORY
Standard 128K
bytes, expandable
to 640K
DIAGNOSTICS
Power-on self test
CLOCK
Time-of-day
with battery
back-up



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SPERRY

The Sperry PC.
What the personal computer should have been in the first place.

CIRCLE 192

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```
        TEST #5   AUTOTEST

   TEST                    RESULTS
1) RADIAL ALIGNMENT        FAIR
2) DISK SPEED              GOOD
3) DISK CLAMPING           GOOD
4) WRITE/READ              PASS

DRIVE #1 MAY NEED SERVICE IN THE
FUTURE, BUT IT WORKS OK NOW.

DO YOU WANT TO TRY AUTOTEST ON
ANOTHER DRIVE?

 HELP   MENU   RETRY   STOP
```

CIRCLE 71

Except for entering text, operations on a file are done via the mouse.

(continued from page 75)

tified, and centered text. The current file is right justified, so that icon is highlighted.

Except for entering new text, any operation I want to perform on the file is done via the mouse. First I select the portion of the file I want to work on, then I choose the function from the menu bar. Suppose I want to change the typeface of one word from Helvetica to Old English: I move the mouse pointer to the beginning of the word, push the button, and sweep the pointer across the word. With the button held down, any text the pointer moves across will be highlighted, or selected. It takes a little practice to get used to this, because the pointer in text files isn't the familiar arrow. Instead, it's what Apple calls an "I-Beam." It looks like two brackets back-to-back. When you want to select a character, word, line, or paragraph, you hold down the mouse button and drag the pointer across the text. Move slowly and you highlight one character at a time; move quickly and you can cover words with one stroke; move down a line instead of across, and you'll select entire lines at a time. I release the button to end the selection (the text remains highlighted), and move the pointer to the Fonts label. I click the button, and the pull-down menu appears. I move the pointer down to the selection for Old English, and release the button. Presto! Within a few seconds, the word I had selected changes to Old English type. To move a paragraph, I point, click, sweep; point, click, move, release. To copy a line to another file, I take the same steps, only with a different label. To Underline something, I do the same thing. If I want to move the cursor from the current page to another end of the file, there's a scroll-bar at the side of the window for it. I just select the box and move it down the side of the window in proportion to the section.

MacWrite is the program that will require the most interaction with the keyboard, although it seems sort of dull talking about the keyboard after knowing what the mouse can do. The Macintosh keyboard plugs into the front of the main unit near the base, using a coiled cord much like the one on your telephone handset. Initially, the keyboard looks like it sits uncomfortably high off the desk top—there's a thick, angled base that was originally designed to contain pull-out reference cards (it doesn't; when all was done, they became superfluous). The keyboard has a very nice touch, however. It's not too spongy, and not too stiff. There are no cursor control keys, and the old Control key has been moved down next to the space bar and renamed Option. The Option key can be used instead to issue some program commands, and during keyboard-intensive tasks like word processing you may prefer this method, because it doesn't force you to take your hands off the keyboard. On the pull-down menus you can select with the mouse, the equivalent keyboard command for these functions is shown next to its name.

The options you have available with MacWrite are extraordinarily easy to use, and making this kind of power this simple is part of the Apple challenge. Will the computing public, given such power, put it to use? Will we break away from traditional methods of text presentation and explore the new territory Macintosh opens up? It certainly won't be the fault of MacWrite if we don't. The program comes with type sizes ranging from 8 point to 72 point. You can choose from several different fonts, and your fonts can be shown in regular, boldface, italic, shadowed, or outlined type. You're only a couple of point/click moves from jazzy report headings, custom formats, or whatever. Because experimenting is so easy, and seeing the effects of your changes is instantaneous, your creativity is bound to flourish.

Photo by Lee Youngblood

"Macintosh will handle 90 percent of the spreadsheets people do," says Joe Shelton, software product manager for Macintosh.

Speaking of creativity, the type-style and background options furnished with the MacWrite and MacPaint diskette are only the tip of the iceberg: Macintosh also has a built-in screen editing function that gives you control over each of the screen's 175,000-plus individual dots of light. This utility, called Fat Bits, is selected from the menu bar like any

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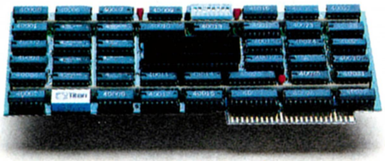

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CIRCLE 119

MacPaint is an incredible combination of simplicity and power in a graphics program.

other function after you've selected a portion of a file. The selected portion is enlarged to show the individual screen dots (or pixels) that make up that part of the image, and you can point to individual dots and turn them black or white.

An artistic touch

But the program where creative endeavors are probably most at home is MacPaint, which is, quite simply, the most incredible combination of simplicity and power I've ever seen in a graphics program. I close the MacWrite sample by clicking the pointer inside the "close" box located in the file window's border, and reveal the diskette contents icons again. I select the sample graphic, called MacPaint Example. The window zooms out from the icon after a few seconds, and the screen fills with a sort of futuristic artist's easel. A drawing area fills most of the window, but the left border contains 32 different brush sizes and drawing shapes, while the bottom border offers 32 different patterns with which to "paint in" your drawings. I'm no artist, but by choosing shape options from the left-hand selection, I could draw perfect ovals, squares, circles, trapezoids, stars, or free-hand shapes with ease. Choosing a specific shape (a circle, for example) produces a "rubber banding" effect when you move the cursor in the drawing area. The shape "pulls out" from the center point your brush starts at, and you can change its size and proportions by moving the cursor in certain directions.

Once you have a shape, you can select a pattern from the bottom group. Click on a pattern, move the pointer back inside the shape in the drawing area, and click again. Your shape is then filled in with that pattern. The graphic quality is stunning, and being able to see such perfect shapes and patterns appear so easily is like suddenly being able to play a Mozart concerto on the piano without having had lessons.

One feature of MacPaint that may lead the way in terms of usefulness is the Gallery. Instead of storing each of your drawings in an individual file—which you can still do, if you wish—this special file lets you store multiple drawings in one place all at the same time. You can even view several drawings at once. Not only that, but by using the Clipboard you can select individual drawings from the Gallery and paste them into text documents.

What Apple has done with MacWrite and MacPaint is make a whole new kind of communication possible—a fusion of words and pictures heretofore impossible.

dent of Software Publishing, "It's going to require a new level of sophistication in the software community, and we think it's going to take awhile for software companies to develop the expertise. We're trying to make software simpler and simpler for people to use, and as a result, that requires more and more effort in programming the application." Software Publishing's PFS:File and PFS:Report will be available for Macintosh in April, with its Write and Graph programs to follow shortly thereafter.

Apple has made things somewhat easier by putting its operating system in ROM. The system contains controls for screen graphics, icons, and some pull-down menus that software developers can take advantage of instead of writing their own. Along with the graphics development, however, software houses have the problem of fitting what have often been large programs into Macintosh's 128k RAM.

Photo by Lee Youngblood

With a converter (center), a Macintosh running IBM 3270 terminal-emulation software is linked to the same mainframe as the actual 3270 terminal (right).

As major beneficiary of the Apple II software boom and the biggest casualty of the MS-DOS bandwagon, Apple is well aware of the importance of software in establishing a product. To this end, Apple has worked closely with a number of software and hardware developers, and has gotten an impressive collection of them on Mac's side. While the mouse, the icons, and the pull-down menus are what make Macintosh easy for the user, they're also what make it difficult for the developer; they may have to rethink the way they design software, which is no easy task.

According to Fred Gibbons, presi-

Lotus Development, whose 1-2-3 program is a best-seller for the IBM Personal Computer, is planning to release a multifunctional package for Macintosh sometime this year. According to Mitch Kapor, the company's president, "It's a major piece

(continued on page 85)

The Texas Instruments makes the best software Best-Seller List.

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The Home Accountant
PLUS
pfs: file
Texas Instruments Professional Computer
WORDSTAR
MicroPro
1-2-3
For the Texas Instruments Professional Computer
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It's no wonder critics have called it "the optimum personal computer."

Popular Computing
October, 1983

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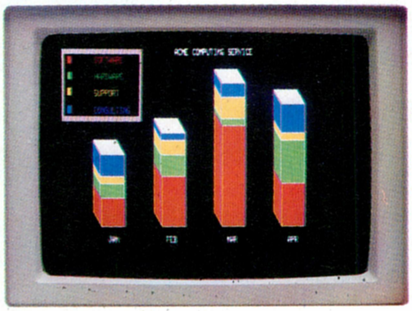

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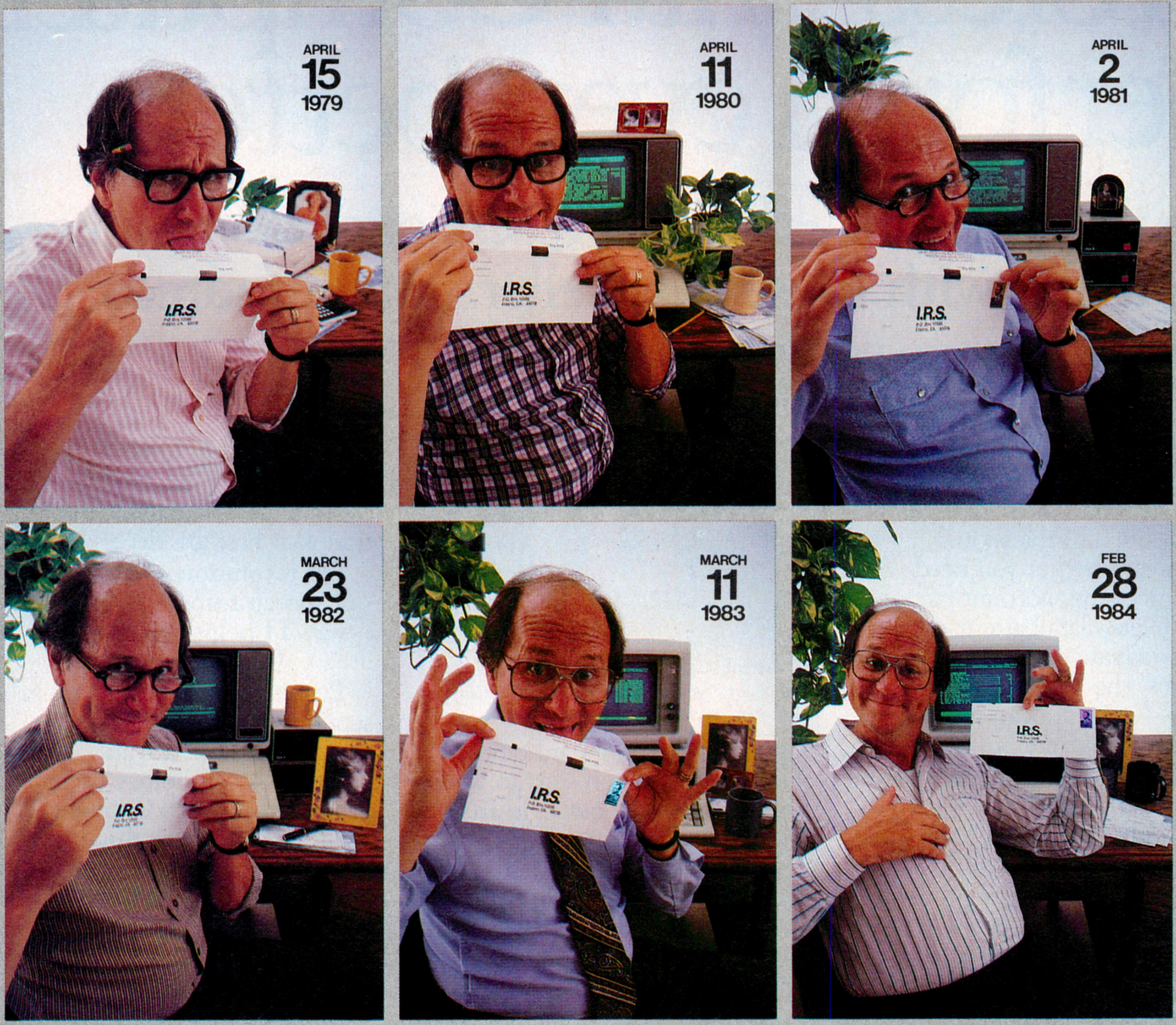

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CIRCLE 90

Is Macintosh part of a system, is it an elegant productivity tool, or is it both?

(continued from page 81)

of software development, comparable to what was involved in doing 1-2-3 originally. Mac is a unique environment, and what we're doing will take full advantage of the unique parts of the machine. So we're not simply hacking up 1-2-3." One after another, Macintosh software developers have expressed high enthusiasm for the product. "The marketplace determines what's best," Kapor says, "but Mac is the only thing that isn't IBM or IBM-like that has a strong chance of becoming widely accepted as its own kind of standard. There's a strong possibility Mac will recreate the Apple II software phenomenon."

Lotus is investing what Kapor calls "multiple man-years" in development of a package that will run in the 128k Mac environment, and Microsoft's Bill Gates points to a similar commitment. "We've been working with Apple on Macintosh software for almost two years. It's tough. You've got to make your software small, and you've got to work with Apple's tools. The packages we've done for Mac will have more features than the software on Lisa, and they fit into a fraction of the RAM." So if writing rich software for a 128k RAM is difficult, it's possible. Gates also feels that it will prove well worth Microsoft's while. "If Apple meets its 1984 sales projections for Mac (about 500,000 units), Macintosh software could account for a 50 percent increase in Microsoft's consumer products revenue, or $50 million. We have over 10 people dedicated to Mac software, and it's a very enthusiastic team . . . it's a fun product." Microsoft BASIC and Multiplan are available for Mac now, and it's Word, File, and Chart packages will be out by the end of March, according to Gates.

Barney Stone, the author of the popular DB Master data-base program for the Apple II, as well as a new advanced version for the IBM Personal Computer, will have a version of the program ready for Macintosh this summer. When asked about the limitations of Mac's RAM on the effectiveness of a sophisticated data-base management program, Stone says, "We have people using DB Master on 48k Apple IIs in half of the Fortune 500 companies." According to Mike Belling of Stoneware, the company that markets DB Master, the advanced version for the IBM Personal Computer has 560k of program code in it. "The Macintosh version will have all the features of the IBM version," Belling says. "It will naturally have to go to the disk more often, but we don't think the program will run much slower because of it." DB Master uses a unique file-management scheme that enables it to sort very quickly, regardless of the number of records in the data base.

Other companies working on Mac software include Software Arts, Think Tank, Hayden Software, Chang Labs, and Think Technology. All will have products out for Macintosh by the end of the year.

What else is new?

Even if every major software house in the world were to announce the imminent arrival of Mac software, there would still be several questions to resolve before you could decide whether or not it was the right computer for you. Chief among these are compatibility and communications. Is Macintosh a part of a system, is it an elegant personal productivity tool, or is it both?

As for compatibility, Steve Jobs pledges that "Apple's future is all Macintosh." The promise is already being made good through a reorientation of Apple's product line. When Lisa was introduced, it was an isolated product, incapable of communicating with other computers, incompatible with even Apple's products, and bereft of third-party software. Macintosh and the products that surround it go a long way toward repairing that damage.

The first product is Lisa 2, which will offer software and media compatibility with Macintosh. The second is a 300/1200-baud modem. Another is Irmaline (a third-party product), which is a protocol-converter that allows a Lisa or a Macintosh using terminal emulation software to communicate with mainframe computers. The terminal emulation software Apple showed us at our demonstration allowed the Macintosh to emulate a DEC VT-100 terminal (for communications with DEC's Vax computer), as well as an IBM 3270 (for communications with an IBM 370 mainframe). The software we saw didn't permit the downloading of data from these computers, which is a serious handicap, but Apple pledged that this capability would be included by the time of the product's release during the first half of this year.

One specific advantage to Macintosh's communications hardware is its use of RS-422/3 serial ports. These ports can transfer data at up to 1,000,000 bits per second, which is 50 times faster than the transfer rate of the more common RS-232 port. Most communications devices (modems, protocol converters) can't handle anywhere near this 1-megabit rate, but having this capability will ensure that Macintosh is in step with improvements in communications technology. The two ports are also compatible with Apple's Applebus communications network, which enables up to 32 Mac or Lisa machines to share expensive peripherals like laser printers or high-capacity hard disk drives. Apple plans to come out with its own laser printer and high-capacity hard disk for network applications by year's end. The Applebus system uses an extremely simple cable setup that allows individual machines to be linked in the network for only $40 per connection.

Another important addition to the Macintosh product line will be a second, external disk drive, which will be

(continued on page 199)

Getting Started

Yes, computers *will* change the way you do things. But those changes can be the bright new beginning for Mariners of every age

by Owen Edwards

Let me say this right away: My life with a computer began in an atmosphere of shame and fear. Even now, as I sit at a keyboard and watch–delighted—as obedient electrons do their precise formation drill at my command, I am surprised that such a scene of domestic bliss came to be. For one thing, I have always considered it an essential part of my style to regard with utter disdain any writing instrument more modern than the quill pen. Though my crabbed handwriting long ago forced me into the age of the typewriter, I only went so far as to purchase a small portable, which I then forced to labor for me for a quarter of a century.

When computer talk began to replace politics, psychoanalysis, and even that old favorite "interpersonal relationships," I felt nothing but horror. Once in a while, a writer at a party might mention—with a certain Ancient Mariner gleam in his eyes—that he had begun to use a computer for word processing, and I counted him among the lost. Even the term struck me as unseemly, related somehow to food processing.

Once, when I had written an article for the Sunday magazine of a major newspaper, my editor there asked me to come in and edit the piece with her. Like kids at a movie, we sat in front of her video display terminal, splitting the screen, moving blocks of text, sending entire faulty sentences off into the ether at the touch of a key. I will own up to a momentary feeling of having stumbled on magic, but her attitude was so prosaic that I decided I was just being impressionable. After a few hours back at the traditional agon with my plucky portable typewriter, the elation was forgotten. Then, a year or so later, I embarked on a book project that required keeping track of page after page of research material—everything from corporate press releases to yellowing bits of newspaper stories. I may as well point out that I am very nearly feeble-minded when it comes to organization, and by the time the book was finished my office looked as if it had been ransacked by customs agents. That a book, neatly fitted between two covers and written in decent English throughout, emerged from that maelstrom, is nothing short of a miracle.

That I had emerged intact was not so certain. There seemed no way, short of a lobotomy, ever to bring back any semblance of order to either my office or my mind. And suddenly, with a fullness that Madison Avenue dreams of, the idea of a computer sprung forth. "Control," whispered a comforting announcer's voice as dream boxes with miraculous software drifted into my desperate imagination. "Power. Precision. Order." the voice went on. I took one more look around at the chaos of the previous year, and threw myself on the mercy of the new age.

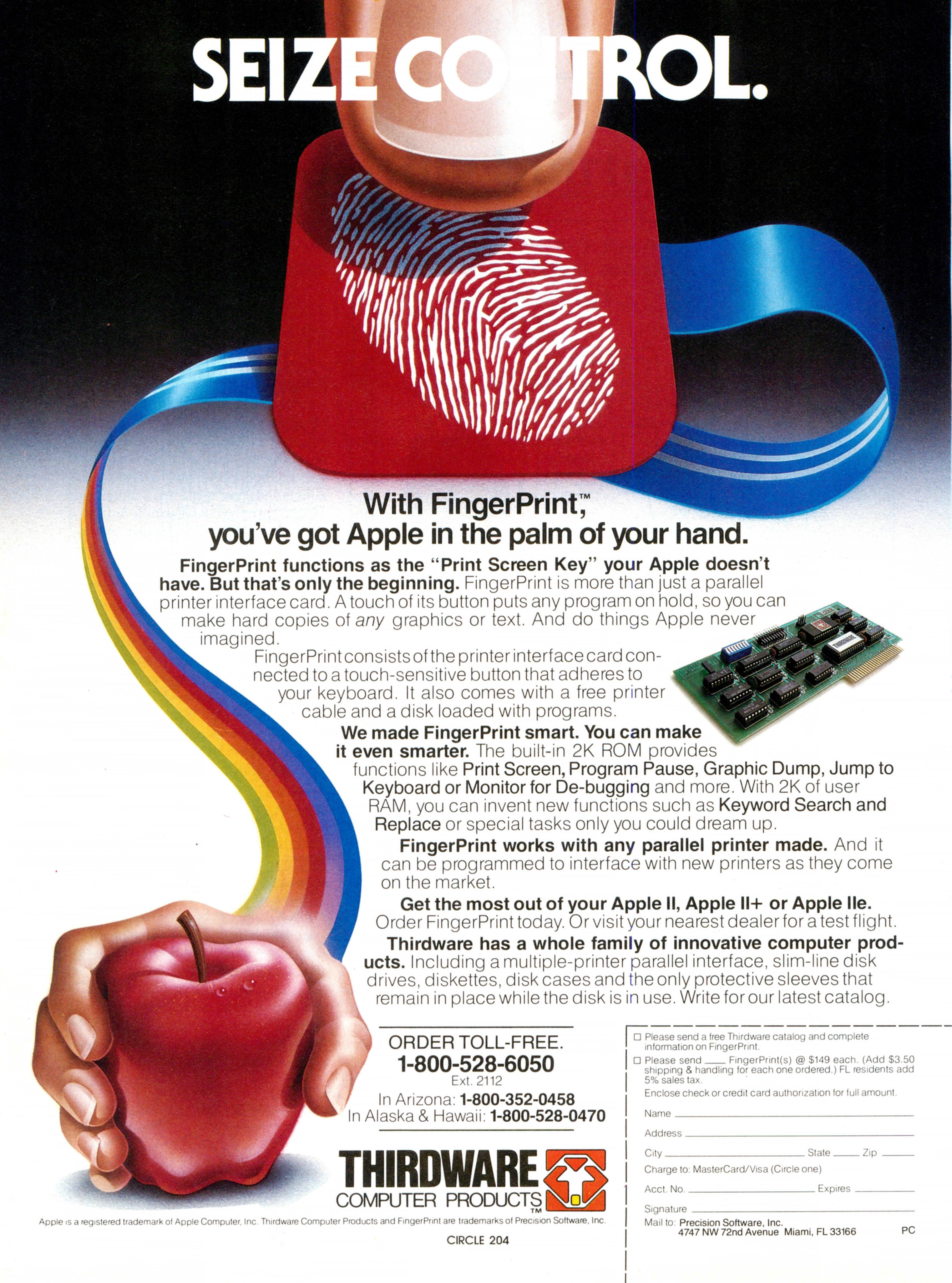
I did not, however, rush into its arms. Rather than do what anyone with an ounce of decisiveness might have done and gone down to the nearest computer store with checkbook in hand, I gave myself what I now perceive as a disgrace period. Which is to say I ordered a computer from Kaypro in Southern California, far enough from my Manhattan address to keep me from having to face up to my new life for a couple of weeks. Unconsciously, perhaps, I relished the delay because I knew that like any self-respecting writer I would feel justified in doing absolutely no work until the machine arrived. I mean, why work in an outmoded technology when the future is just a few days off?

This sweet limbo lasted less than 24 hours. Early on a gunmetal dawn I sat bolt upright and realized with a shudder that the arrival of the computer was in the same league as a visit from my Aunt Mildred. Is there anyone out there lucky enough not to have some relative so critical and

The expectant computer user is struck with a feeling of malaise as he surveys his current lifestyle. Minor adjustments may be in order before the computer arrives.

Owen Edwards is the co-author of Quintessence *(Crown). He and his Kaypro II are currently at work on a book entitled* Quintessential Technology.

Illustrations by Norman Bendell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CIRCLE 204

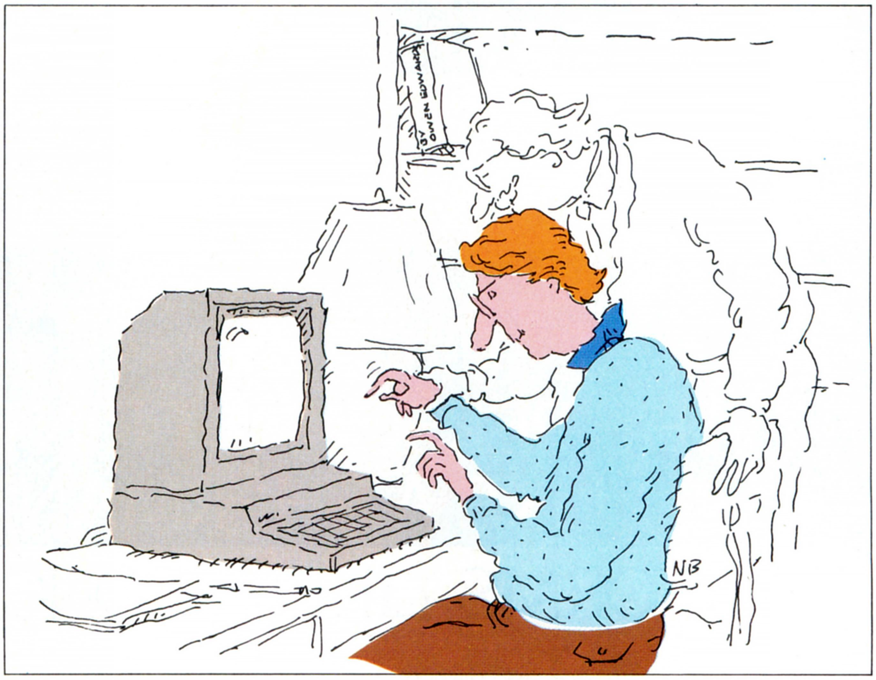
With time, I came to realize that computers had arrived on Earth to help me, not to test me.

mean-spirited that their visits are closely akin to an inspection by the commanding general? These are the aunts or uncles or in-laws who will take the trouble to find dust balls in the deepest recesses of the hall closet, for whom we prepare with frantic paroxysms of housecleaning, knowing that we'll never get things anywhere near spotless enough to satisfy them. With a twinge of recognition, I realized that my computer would almost certainly be one of these.

Before sunup the whole scenario had played itself out in my mind. One look around at the dishevelment of my life and the severe, fastidious computer would adamantly refuse to work under such conditions. After all, I figured, what does a computer know about real life? Surrounded since birth with neat workers in spotless clothes, a stranger to clutter, mess, redundancy (all close friends of the writer), with a brain impressed only by precise essentials, the computer could not be in my apartment for more than a few minutes before the scandalous conditions of my working life would sicken it. If it did not leave outright, the best I could expect of it would be a glowering, shaming presence, sitting darkly in some corner, forever user-cranky and unapproachable. An expensive and perpetual rebuke, while I dwindled away into oblivion and penury, pecking away at my weary typewriter. Too Dickensian for you? It was the most optimistic of my imaginings.

But while I dithered and worried, the Kaypro was on its way, and there was no turning it back. But I couldn't let it see the truth. If it learned of it later, well, perhaps by then it would have taken a liking to its disheveled but possibly gifted owner. There might still be a chance. For the next week, long hours at night were devoted to the painful business of sifting through the layers of civilization that descended from simpler days when I had been trying to write the great American haiku. Of course, I knew that time was short and my career detritus deep, and had resolved to destroy first and ask questions later; but no writer can rip up a piece of yellowed paper rising out of his past without having at least a peek.

The agony, embarrassment, chagrin, and sheer humiliation of the following days are better left undescribed. What could be more glacial and grim than a writer's unfinished, unpublished, unremembered past? At least this writer's. All I could do to ease the pain was thank heaven that the fastidious, know-it-all Kaypro would never get a chance to see the physical and spiritual tar pits of my career. What there *was* for it to see by the end of the week looked like a neurosurgeon's workbench. Half-written short stories begun seven years ago had joined half-eaten peanut butter sandwiches begun at about the same time in a huge garbage bag, which I filled up while retaining the option to throw it out or sell it to the University of Texas library for an undisclosed amount of cash and preferred stock in John Updike's future. In the end, the University's loss was a New Jersey landfill's gain. And what I ended up with was a shockingly denuded desk, whose wood grain I could barely remember ever having seen and whose virginal clarity seemed to announce the departure forever of that lovable old shambling idiot friend, my former self.



With the help of a patient expert, the novice recovers from his initial future shock as he begins to discover the power computing can give him. The expert assures him that pressing the wrong key will not cause the machine to explode.

Of course, I well knew that I was still far from the paper-chaste paragon that I hoped the Kaypro would take me for, but at least my work space had the appearance of hygienic order that I imagined a computer would find homey. Now there was little to do but wait with anxiety and hope that the cosmetic new me would pass muster.

Shortly thereafter, the Kaypro arrived, boxed with intimidating forethought and with enough perfectly

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CIRCLE 33

Until I began to work with the computer, my idea of high technology was a Swingline stapler.

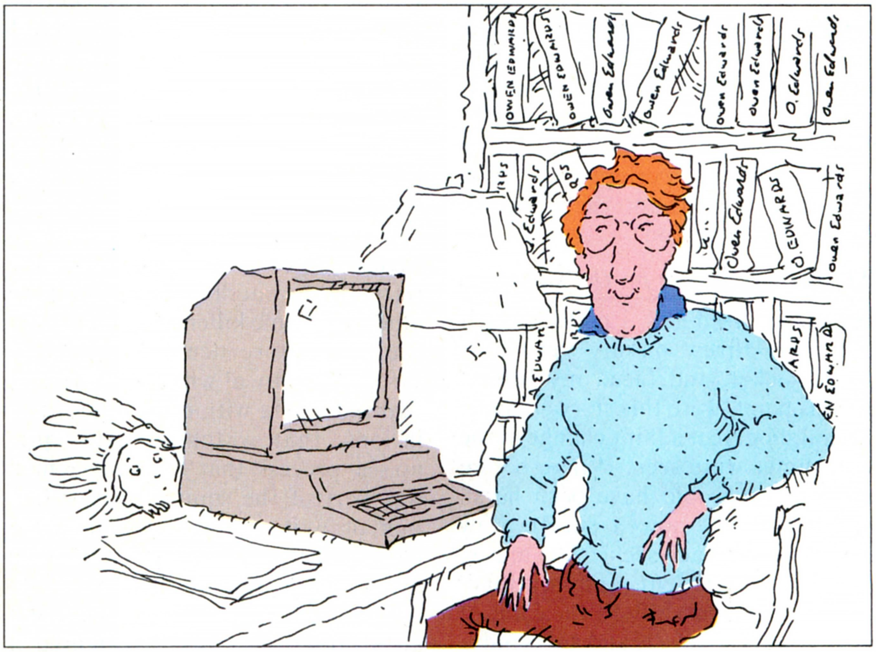
placed cushioning to let it survive delivery through the bomb bay doors of a B-52. As I went about unpacking the machine and setting it up on the stark splendor of my desk, I panicked all over again. The no-nonsense steel box of the Kaypro, with its vaguely military look, seemed formidably ready to go, a solid piece of can-do machinery in a writer's somewhat forlorn what-the-hell world. I knew at once that I hadn't read enough, didn't know enough, wasn't good enough to deal with my powerful machine. Its dark CRT screen stared at me with unblinking neutrality. I covered it with my son's terrycloth robe. The kid might get a little cold, but the Kaypro's appraisal was a whole lot colder. I retired to a far corner and watched the robed figure suspiciously, wondering if there was a piece of software that would simply simulate a working computer screen for those times when friends dropped by.

Early the next afternoon, after an anxious night and a nervous morning phone call, Bruce arrived. Bruce taught at a local university, and had been recommended by my neighborhood computer dealer as someone who could defang my fears with an hour or two of instruction at about the same sort of rate charged to rent a table at the kind of restaurant that doesn't put its prices on the menu. Bruce had the reassuring look of a successful internist who never misses a morning run or a diagnosis. Even better, he gave evidence of being totally a man of the computer age, just as I was a museum-quality regenerate of the stone tablet era: He wore a digital watch, slightly tinted wire rim aviator glasses, a smooth hairless pate offset by a trim vandyke beard, and best of all, a belt-hung beeper with an LED screen that displayed the phone number of his caller. Bruce looked like the kind of person that a computer would get along with famously from the prompt A.

To his everlasting credit, Bruce did for me what Dr. Spock had done years ago when my son was born: He reassured me that few of the mistakes I was bound to make would be catastrophic. And though I didn't really believe him right away, my soothing extra-terrestrial emphasized that the computer had arrived on Earth to help me, not to test me. Though I had been regaled with the wonders of computers by saucer-eyed ecstatics with increasing frequency during the past year, I had always regarded these people as quasi-religious oddballs, and viewed their rantings with arch skepticism. But Bruce didn't clutch at my lapels, or foam at the mouth; he just engaged in a bit of discreet family counseling, and in the process began the evolution of my fearsome machine into a benign and well-intentioned computer.

Not all at once, however. Even with my other-planetary professor's ministrations, I didn't feel that any self-respecting computer would take kindly to spending a lot of collaborative time with a man whose idea of high technology was a Swingline stapler, and at that, had to ask for help filling it.

My anxiety was in no way eased by the nerd's revenge language that liberally spiced my instruction books with a vocabulary of immensity and doom. The pile of books that came with the computer would have been off-putting enough, suggesting as it did that only great scholarship would suffice to put one firmly into the new era. But to come up against the stentorian tones of such terms as "global search," "microjustification," "computer crash," and (oh my God) "fatal error," immediately implied to me that I was messing around with stuff that could blow up in my face if I merely sneezed in the middle of a crucial keystroke. Only slowly did I realize that these terms actually were meant to intimidate me. They were the long-awaited counterattack of all those kids in high school who had worn their plaid flannel shirts but-



Pre-computer days fade into distant memory as the convert sits by his new hero, basking in his pleasure at the computer's ability to help him turn out more, and possibly better, work than he ever could with his old typewriter.

My experiences with the computer have, quite literally, changed my life.

toned all the way to the top and awful, thin black socks that fell down around their ankles by third period.

After long years of suffering, of never getting anything right (stylistically speaking), these ill-fated characters found themselves in the rare position of being able to invent an entire new terminology. Did they wimp out? They did not. When they might have said "file scan," they said "global search." When they might have said "serious problem," they went all the way with "fatal error." In the process, they turned very well-dressed, socially adroit chaps like myself into whimpering clods. And who can deny them their much-deserved satisfaction?

Things will never be the same

Having realized this, I pulled myself together, threw on my very best tweed jacket, and faced my future. At this point, were this story a movie, you might detect a faint change in the way things were seen. Where before the lighting would have been harsh and revealing, now a softer glow would suffuse each scene. The music, somewhat strident and anxiety-inducing, would shift to the kind of overly sweet strings that drew Sandra Dee and Troy Donahue toward each other across an endless quarter-mile of beach. Because here is where we get a story of revelation and true love that might almost be hard to take if it weren't so true.

With Bruce's encouragements echoing in my ears, plus my total determination not to have spent my money in vain, plus those wolfish bills sniffing at the door, I sat down in front of the Kaypro, placed my hands on the keyboard, and began.

I would like to say here ". . . and the rest is history," but that would be overinflating my importance in the literary scheme of things. What I will say is simple enough, but no less important to me: Nothing was ever the same again. In only a few minutes I realized that my Venusian instructor was right, the computer *had* come to help me, not to add to my challenges. As I began to unravel the minor mysteries of WordStar, I made the most unexpected and delightful little discoveries. That, for instance, my fingers seemed to fly over the keys; and without the resistance and clatter of my venerable typewriter, the amount of energy used to get words down seemed to be cut by 50 percent or even more. Or that the fact that I didn't have to think about returning a carriage at the end of each line let me begin thinking in complete sentences perhaps for the first time since I had learned to type. Or that not having to feed in a new sheet of paper at the beginning of a new page gave me no excuse to get up and pace, open the refrigerator, watch cartoons, or all the other little time killers that I had only the day before deemed necessary safeguards to a writer's sanity. I realized, along with these other revelations, that watching paper pile up—a process that I had assumed was part of the squirrelish satisfaction of writing—was in fact a reminder of its endless burden. Having my words roll immaterially back into the memory of the computer was not at all unsettling, as I had figured it would be, but rather had a wonderfully freeing effect. Not least, of course, was the miracle of printing out, which, though I didn't experience it for a week or so after starting to work on my Kaypro, capped my realization that a superior creature had, indeed, come to my rescue. (To stand in the bathroom shaving while listening to myself type at least 120 characters per second in the other room is now one of life's immense new pleasures.)

What we are talking about here is a series of small revelations that added up to a major epiphany, one that has quite literally changed my life. For as long as I can remember, since the age of 16 or so when I decided that what I wanted to be was a writer, I have been convinced that I didn't like to write. What I liked, unquestionably, was the feeling that I had written something, especially if others admired it; but the writing itself had always been done with great reluctance and the groaning of a soul in torment. After a few days with the computer, it became wonderfully clear to me that I liked to write, and that what I had hated all these years was the drudgery that inevitably accompanied the act.

Another happy ending

The ending, as you can guess, is almost excruciatingly happy, nothing less than a middle-aged writer who has rediscovered himself and the true joy of his oft-cursed calling. It is as if the pipeline through which I have forced my work all these years had been clogged up at the far end by the nitty-gritty boredom of all the things about writing that aren't writing, and once they were removed, a kind of suction was created that seems to pull work out of me. No longer do I sit at dinner and look across the room at my waiting desk with the loathing of a condemned man catching a glimpse of the gallows. Knowing that the Kaypro is there to take care of me, I'm almost shockingly willing to get down to business—and trust me, I can hardly believe I'm saying such a thing. In the few months I have had the machine, I have turned out more work than in any year since I have been doing my writing in the evening after a day's work as an editor.

And as if it wasn't reward enough, what I have written seems to undergo significantly less editing (though this may be due to the tendency of justified right margins to somehow stay an editor's hand) and read better.

The music is swelling to an almost unbearable crescendo here, but love stories tend to end that way. The Kaypro is my hero. Recently, at the end of writing in two days what might have been a long, drawn out piece of work, I leapt up from the computer and shouted, "I'm in business!"

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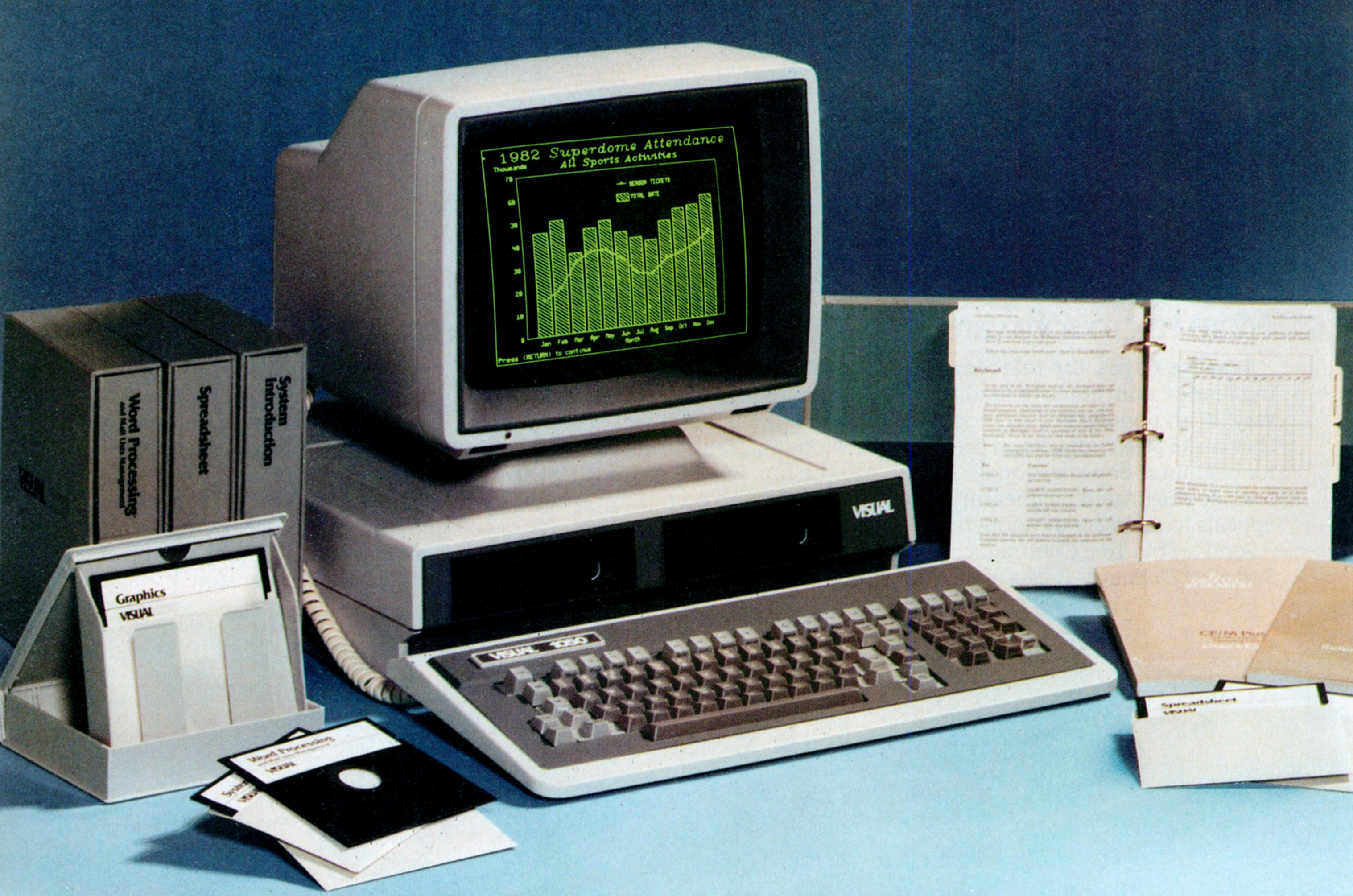
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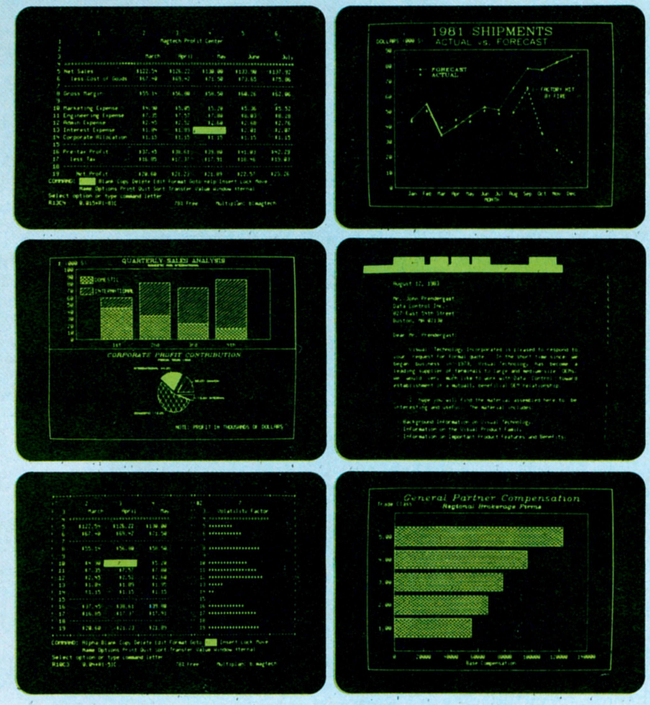
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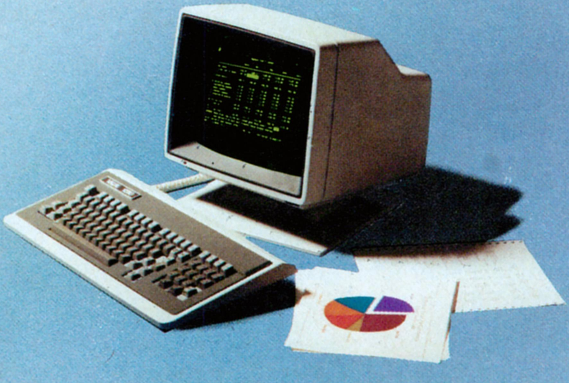

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CIRCLE 115

Transportables Let You Take it All With You

Having the power of the office at your fingertips, no matter the location, is just one way transportables are changing the way we do business

by Alan Venable

Many managers are finding that computers in the office can mean increased productivity. But what about those of us who like to (or need to) take our work out of the office? How can we carry our work with us, and then bring it back to the office without disrupting our level of productivity? The answer lies in making our computers transportable.

Utilizing a portable computer is one solution ingenious users are coming up with to enable them to work at the computer when and where it suits them best. Globetrotters find a well-cared-for portable can be a tremendous business partner. Those who merely want to take work home from the office can gain transportability simply by shuttling diskettes between compatible computers at home and in the office. Others, with more sophisticated needs such as access to mainframe computers' data banks, use the phone lines to carry their work with them.

Whether a person's idea of transportability is booting up in Banjuwangi or the bedroom, the rewards can include better use of time and finer adjustment between the nature of the work and the right place to do it. But taking a computer new places has its hazards.

In case you hoped to be the first to run WordStar in the jungles of Peru—forget it. Harold Beard beat you there. He may also be the first man to subject an Osborne 1 to the trials of the North African desert. Beard has been using the Osborne for a year now as part of his equipment for his work in seismic geology. His Denver company, Quality Seismic Control, contracts with the major oil companies to assist and monitor seismic teams which set off detonations and plot the velocities of sound traveling underground to map the subterranean structures of the Earth.

"Normally when you do this noise analysis you would fly the tapes from the Digital computer that you use in the field to a computer center to have them analyzed, and the results would be shipped back," Beard says. "That takes one to two days while the whole crew is standing by. With the Osborne, I can take some information off the paper printout from the Digital, work it up that afternoon, and get a good preliminary handle on what we need to do to start production the next morning. I'm getting a ballpark figure that allows us to get a jump on things."

He also keys in data to follow each project as it proceeds, and attends to word-processing and bookkeeping chores. Beard carries a small Epson MX-80 printer, extra fuses "and the phone number of John Gaudio," a

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Alan Venable is a free-lance writer living in San Francisco.

No matter where your work takes you, the new transportables make good traveling companions.

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MIAMI
COMPAQ
ST. LOUIS
SAN FRANCISCO
NEW YORK
CHICAGO
ATLANTA
LOS ANGELES
BOSTON

Photograph by Ross Elmi

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	NAME	DESCRIPTION
1	RULE78	Interest Apportionment by Rule of the 78's
2	ANNU1	Annuity computation program
3	DATE	Time between dates
4	DAYYEAR	Day of year a particular date falls on
5	LEASEINT	Interest rate on lease
6	BREAKEVN	Breakeven analysis
7	DEPRSL	Straightline depreciation
8	DEPRSY	Sum of the digits depreciation
9	DEPRDB	Declining balance depreciation
10	DEPRDDB	Double declining balance depreciation
11	TAXDEP	Cash flow vs. depreciation tables
12	CHECK2	Prints NEBS checks along with daily register
13	CHECKBK1	Checkbook maintenance program
14	MORTGAGE/A	Mortgage amortization table
15	MULTMON	Computes time needed for money to double, triple, etc.
16	SALVAGE	Determines salvage value of an investment
17	RRVARIN	Rate of return on investment with variable inflows
18	RRCONST	Rate of return on investment with constant inflows
19	EFFECT	Effective interest rate of a loan
20	FVAL	Future value of an investment (compound interest)
21	PVAL	Present value of a future amount
22	LOANPAY	Amount of payment on a loan
23	REGWITH	Equal withdrawals from investment to leave 0 over
24	SIMPDISK	Simple discount analysis
25	DATEVAL	Equivalent & nonequivalent dated values for oblig.
26	ANNUDEF	Present value of deferred annuities
27	MARKUP	% Markup analysis for items
28	SINKFUND	Sinking fund amortization program
29	BONDVAL	Value of a bond
30	DEPLETE	Depletion analysis
31	BLACKSH	Black Scholes options analysis
32	STOCVAL1	Expected return on stock via discounts dividends
33	WARVAL	Value of a warrant
34	BONDVAL2	Value of a bond
35	EPSEST	Estimate of future earnings per share for company
36	BETAALPH	Computes alpha and beta variables for stock
37	SHARPE1	Portfolio selection model-i.e. what stocks to hold
38	OPTWRITE	Option writing computations
39	RTVAL	Value of a right
40	EXPVAL	Expected value analysis
41	BAYES	Bayesian decisions
42	VALPRINF	Value of perfect information
43	VALADINF	Value of additional information
44	UTILITY	Derives utility function
45	SIMPLEX	Linear programming solution by simplex method
46	TRANS	Transportation method for linear programming
47	EOQ	Economic order quantity inventory model
48	QUEUE1	Single server queueing (waiting line) model
49	CVP	Cost-volume-profit analysis
50	CONDPROF	Conditional profit tables
51	OPTLOSS	Opportunity loss tables
52	FQUOQ	Fixed quantity economic order quantity model
53	FQEOWSH	As above but with shortages permitted
54	FQEOQPB	As above but with quantity price breaks
55	QUEUECB	Cost-benefit waiting line analysis
56	NCFANAL	Net cash-flow analysis for simple investment
57	PROFIND	Profitability index of a project
58	CAP1	Cap. Asset Pr. Model analysis of project
59	WACC	Weighted average cost of capital
60	COMPBAL	True rate on loan with compensating bal. required
61	DISCBAL	True rate on discounted loan
62	MERGANAL	Merger analysis computations
63	FINRAT	Financial ratios for a firm
64	NPV	Net present value of project
65	PRINDLAS	Laspeyres price index
66	PRINDPA	Paasche price index
67	SEASIND	Constructs seasonal quantity indices for company
68	TIMETR	Time series analysis linear trend
69	TIMEMOV	Time series analysis moving average trend
70	FUPRINF	Future price estimation with inflation
71	MAILPAC	Mailing list system
72	LETWRT	Letter writing system-links with MAILPAC
73	SORT3	Sorts list of names
74	LABEL1	Shipping label maker
75	LABEL2	Name label maker
76	BUSBUD	DOME business bookkeeping system
77	TIMECLCK	Computes weeks total hours from timeclock info.
78	ACCTPAY	In memory accounts payable system-storage permitted
79	INVOICE	Generate invoice on screen and print on printer
80	INVENT2	In memory inventory control system
81	TELDIR	Computerized telephone directory
82	TIMUSAN	Time use analysis
83	ASSIGN	Use of assignment algorithm for optimal job assign.
84	ACCTREC	In memory accounts receivable system-storage ok
85	TERMSPAY	Compares 3 methods of repayment of loans
86	PAYNET	Computes gross pay required for given net
87	SELLPR	Computes selling price for given after tax amount
88	ARBCOMP	Arbitrage computations
89	DEPRSF	Sinking fund depreciation
90	UPSZONE	Finds UPS zones from zip code
91	ENVELOPE	Types envelope including return address
92	AUTOEXP	Automobile expense analysis
93	INSFILE	Insurance policy file
94	PAYROLL2	In memory payroll system
95	DILANAL	Dilution analysis
96	LOANAFFD	Loan amount a borrower can afford
97	RENTPRCH	Purchase price for rental property
98	SALELEAS	Sale-leaseback analysis
99	RRCONVBD	Investor's rate of return on convertable bond
100	PORTVAL9	Stock market portfolio storage-valuation program

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"I was able to bring the portable to the client and key in the relevant data."

not be the best solution, and it pays to consider alternatives carefully.

Blake Hannaford had no illusions about strapping a 26-pound Kaypro II to the back of his bicycle and commuting with it between his Berkeley apartment and the University of California lab where he's doing doctoral research in electrical engineering. He bought the Kaypro because he thought it was the best deal, and because it wouldn't overwhelm his desk at home. However, he did show it off at the lab enough to persuade the lab to buy one of its own—setting off a minor buying spree among his colleagues. Getting more people to own what you own is a fine way to enhance your transportability. Now Hannaford simply shuttles disks back and forth, "like a whole briefcase but much lighter. Why move the computer around," he asks, "when, at the price, you can put them all over the place and just carry disks?"

Most of what he takes home is word-processing work. The Kaypro doesn't run the FORTRAN modeling programs he uses to study the neurological control of movement fast enough to rival the large computer at the lab. What Hannaford gains, mainly, is that he rarely has to go into the lab at night to work, and he can spend half a day working at home now and again.

How vulnerable are disks?

Hannaford worries very little about the safety of the disks he transports strapped on the back of his 10-speed, though he does wrap them in a plastic bag when it rains. Although he's had his share of disk failures over the years, he thinks floppies are "a lot more rugged than people give them credit for."

Should he be more concerned for their safety outdoors? For every floppy that receives mortal injury in transit, many more probably expire from extended usage or injuries inflicted in the disk drive. Misaligned drives take a heavy toll on diskettes, and moving machines tends to knock disk drives out of alignment. According to those who repair portables, misalignment of the drives is the most frequent problem they encounter. When a drive gets out of alignment on most portables, the computer claims that the disks are bad, and only the repairman knows for sure. Maintenance experts stress that when moved, disk drives should be locked down with cardboard travel inserts or a scratch disk in place.

On balance, it's probably easier on disks to carry them around than to move the machines they run in. Users fearful of simple physical damage in shuttling disks might consider what Memorex test engineer Bob Cassidy reports: "We once actually tried to destroy an 8″ floppy disk on which a program was recorded. First we rolled it into a 2″ tube, beat it on the edge of a table, and flattened it out. The program on the disk still ran. Then we scratched the surface with the end of a paper clip. No change. Then we wrote on the jacket with a ballpoint pen. No change. After rubbing a magnet over a disk, however, some changes were noticed. The program on the disk would still run, but we noticed errors in several statements. I used to carry my disks around in a stiff container and would cringe whenever I saw someone bend a disk," he says, "but after we did that little experiment I wasn't so worried."

Although his magnet test produced errors, Cassidy also minimizes electromagnetic environmental hazards. "You might find some nuclear physicist who will say yes," he says, but he doubts that airport baggage x-ray devices are harmful to diskettes, whatever their electromagnetic properties might be.

"In order to access the data on a disk, you have to fly a head quite close to the disk surface," he argues. "Short of getting a super-strong electromagnetic field right next to the disk carrier, it would be almost impossible to change it." He doubts that dangerous fields exist in the general environment except very close to large electric motors such as those which power a train engine or other heavy industrial equipment. "I've never seen an electromagnetic effect on a disk except by rubbing a magnet over its surface," he says.

Lewis Ray takes strong exception to Cassidy's coolness. He says he's seen enough circumstantial evidence to implicate airport devices. He says that several times the electromagnetic stripping on his credit cards has also been fouled by airport x-ray gear. Who knows how far out of adjustment those machines may be, he asks, or how strong the fields they create are?

Ray also notes that destruction of a diskette often results from a computer being moved, then not securely plugged in again, or plugged into a loosely connected socket. He warns that the electrical arc at the plug will ruin diskettes in the drives.

Still, the undisputed bane of diskettes is dust. In spite of Beard's clean record in the desert, dust on the disk surface or in the drive increases abrasion. Cigarette smoke makes it worse, perhaps by creating a film that causes particles to adhere, like sandpaper. Some users have had to give up smoking near the computer.

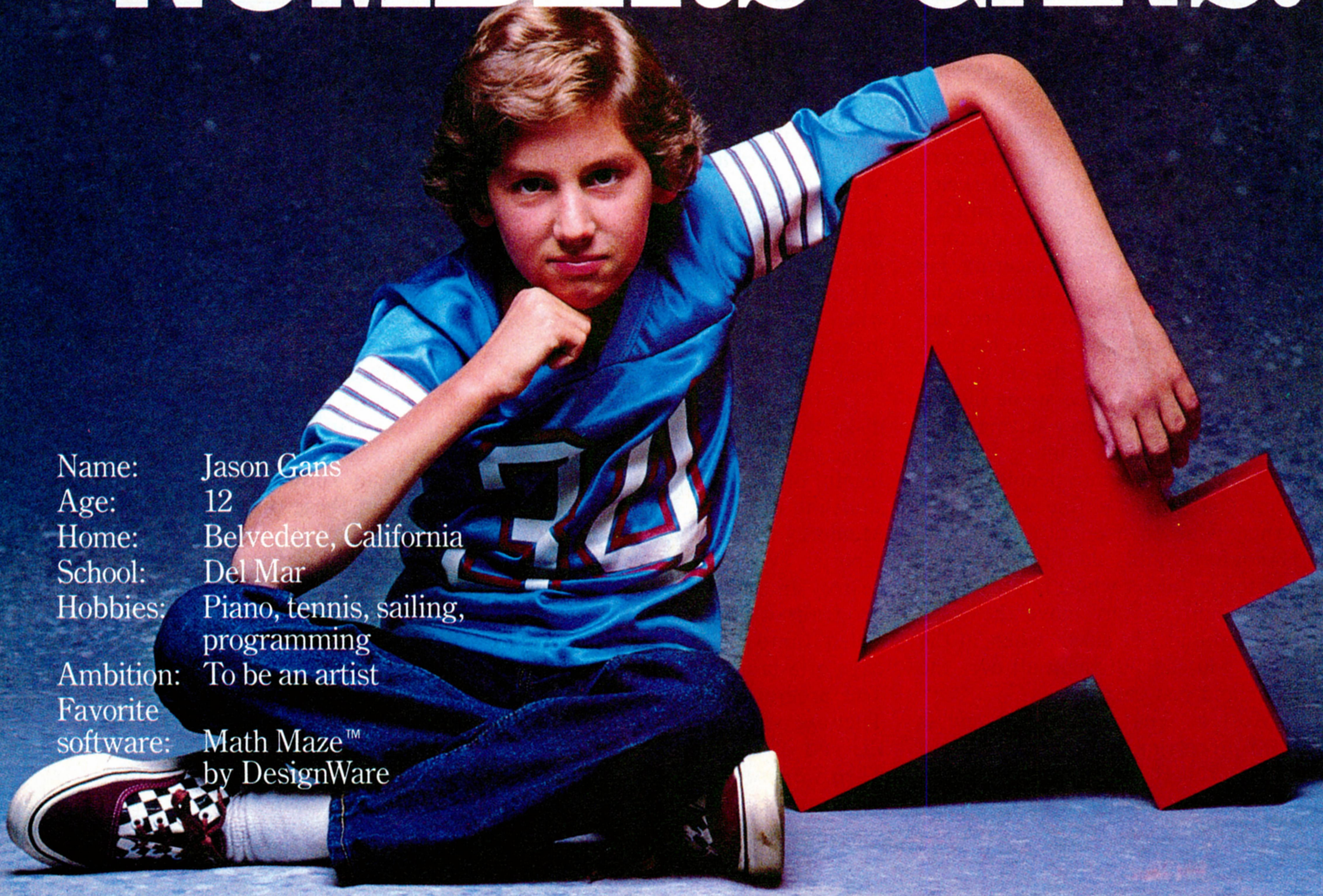
Diskettes should also be kept away from heat. Sunlight through a car window will warp a diskette as it will a phonograph record.

Mainframe necessity

When working efficiently at home requires access to a mainframe at the office, carrying diskettes may not be the best approach. Caroline Johnson tried it but moved on to something better. As treasurer of II-VI, a firm in Saxonburg, Penn., that manufactures infrared optical equipment for high-power lasers, she wanted to carve out some quiet time to examine budget alternatives.

"I was interested in bringing home

THEY CALL HIM "NUMBERS" GANS.



Name:	Jason Gans
Age:	12
Home:	Belvedere, California
School:	Del Mar
Hobbies:	Piano, tennis, sailing, programming
Ambition:	To be an artist
Favorite software:	Math Maze™ by DesignWare

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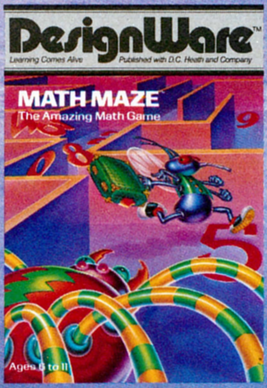

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CIRCLE 187

Getting people to buy what you own is one way to enhance your transportability.

the ability to work in the general ledger and to analyze data," she says. For instance, she wanted to see how interrelated changes in the company's wages and bonus program would affect the budget. "But I work with my office door open, not just in the physical sense, but in the psychological sense, because I want people to feel free to drop in. I don't take the phone off the hook. As the company's financial manager I want to be accessible."

Her need for uninterrupted computer time contributed to a general family decision to buy an Apple II. She then bought VisiCalc. "I thought, 'Oh boy, this is going to be great!' But most of the data I wanted to massage is on our mainframe, and I had to physically re-enter the data into our Apple." Those three or four hours of monthly data re-entry were a real headache, so she ordered another office terminal and had it installed in her home to make mainframe access easier. Johnson's son came out the big winner. He attended computer camp to learn to write machine language, and now has no competition from mom on the Apple.

Transporting mainframe access has opened up valuable new windows of working time for Johnson. "If I wait until everyone else is in bed and work from 10:00 to 11:00, or if I get up at 5:30 in the morning and work for an hour or two, that's really creative time! The bottom line is, working at home at the right hours, I can get a heck of a lot done."

Bedroom rivals?

Having a computer at home is more problematic when the rest of the family isn't so enthusiastic. Domestic transportability can challenge domestic tranquility. Steve McMahon admits his Kaypro wound up in a corner of the bedroom because, although he was proud of it, it wasn't so attractive that he wanted it in the living room. He also chose the bedroom because he used the computer in the evenings and wanted more privacy than he needed reading a book.

McMahon is assistant to the president of Fireman's Fund Insurance Companies in Novato, California. Prior to getting the Kaypro, he regarded computers as a wave of the future he didn't want to ride. But at work he'd been handed the task of preparing a management report on what impact layoffs around the organization might have on the company's affirmative action goals, and he needed a personal computer's help. "The company mainframe is a system set up to facilitate *transactions*, and management reporting is an outgrowth, almost an afterthought," he says. The mainframe didn't serve managers' needs, and working through programmers and systems analysts was extremely frustrating. "The mainframe kept saying, 'Here's what we can give you, now ask for it.' Anything else takes a lot of approvals, maybe 25 days of programming, and will cost the company $25,000." McMahon couldn't understand why simple management analyses were so hard to do. "They would explain things technically," he says, "my eyes would glaze over, and I would withdraw. Finally, I got tired of feeling helpless."

Taking the offensive, he signed up for a leadership and management training program conducted by the Western Behavioral Sciences Institute (WBSI) in La Jolla, Calif., whose tuition includes purchase of a Kaypro portable computer and a modem. One of WBSI's objectives is to train people like McMahon to see the computer as a manager's tool. McMahon was introduced to his coparticipants and the Kaypro at an eight-day seminar, and the basis was laid for a continuing program in which telecommunicating would allow ongoing workshops and dialogue via a computer conference. WBSI shipped McMahon's computer to his home, where he ensconced it in the privacy of his bedroom.

At first, McMahon was sorry he'd gotten involved. He had a few problems learning to operate the computer efficiently, and the problems were compounded by a bad disk drive and his physical isolation from other participants in the program. He got the disk drive fixed, though, and gradually learned to cope. Now he had a nice, private base from which to conquer this wave of the future and lay a basis for solving problems at work. He found "flipping in and out" of the lively telecommunicating of WBSI and his newfound modem access to the EIES (Electronic Information Exchange Service) computer-conferencing facility in New Jersey more and more stimulating. He began conversing with people more by modem, less by phone. "I don't call people anymore. I send them a message to meet them for lunch or to get hold of them through EIES."

When he steps back and looks at the changes in his workstyle, he admits, "If I'd had a computer in my office as well as at home in the beginning there would have been less of an impact." Whatever the impact on his job, though, one large effect was beginning to show elsewhere. His wife, Trish, was none too pleased, and after the novelty wore off a little she began asking him why all that stuff had to be there in the bedroom. "It became a sore point between the two of us," he says, "because it began to cut into the only time we really had together. With my 10-year-old son and 13-year-old daughter it became a family joke: 'Oh, dad's in playing with his computer.'"

The computer was taking more concentration than the paperwork had, and interruptions by his children bothered him more. He gradually realized that the computer was stealing time and attention away from them.

Talking the problem over with other people on his modem network, McMahon concluded that the only solution was for Trish to get hooked

Denver-based Osborne consultant providing long-distance operating advice.

The Osborne itself has functioned perfectly despite environmental extremes. Beard has always been able to find power when he needs it, even in "some pretty shaky situations." Protection from the elements is a greater concern.

"In the North African deserts we live in tents, which is extremely dangerous to the Osborne with the dust and all," he says. Bolivian jungle humidity is also hazardous. "I take very great precautions. I have those little packages that eat up humidity, or I hide under a cloth sheet with a plastic sheet on top.

On airplanes, the Osborne always flies with him in the passenger compartment. "I handle it very carefully," he says. "It's my livelihood, and if I'm away on a foreign contract for two or three months and it breaks down, I'm out of luck." The spotless maintenance record of Beard's Osborne is a tribute to his vigilance.

Lewis Ray, the man responsible for seeing that the numerous transportable computers of Satellite Business Systems stay in usable shape wherever they go, warns, "Really mobile units cause a lot of trouble with maintenance." His company's computers have frequently been damaged when checked through on airlines. Especially overseas, Ray tries to confirm ahead that maintenance is available where machines will be going. He thinks it's sometimes smarter to rent locally than to transport. In any event, he says, "The user of a portable microsystem needs to know more about the machine than the user of a stationary system." Circuit boards loosen and need to be reset, for example. Those repairing portables say that hard jolts also cause fatal hairline cracks in some boards. Beard carries extra boards as "very cheap insurance."

Reductions in weight, bulk, and power needs are making it easier to take and use personal computers anywhere, and changes like the substitution of bubble memory for disk storage are reducing damage caused by vibration, dust, and unstable power sources. MPC Corporation, which

GETTING THROUGH CUSTOMS

Geologist Harold Beard has taken his Osborne to the wilds of South America, North Africa, and the Middle East. Customs, he says, is the hardest part of traveling with a portable computer. "I almost lost the Osborne in Libya," he says. "They almost took it away from me. I was held up two days trying to get it cleared. They didn't know how to undo it or plug it in, much less turn it on, and I had to give them a little demonstration."

Problems occur even in U.S. and European customs, but officials in third-world countries in particular can become suspicious of portable computers because they don't know what they are, or how to deal with them.

Beard gets some help through customs when entering a country—he's usually met at the airport by an oil company representative—but things can be even tougher when he's leaving. "They'll let you in the country with it, but taking it back out is pretty rough." Even so, Beard figures that as "one of the oil and gas people" he fares better than other travelers. He urges anyone traveling off the beaten path to check in advance with their connections at their destination, to explain what kind of equipment they're bringing and get some tips on the easiest point of entry.

Border crossings in many South American countries are fairly easy. Tim Crawford, whose Cherry Creek Microsystems exports computers to Latin America explains that if you enter Peru, Chile, or Argentina with a computer, the serial number of the machine will be written directly on your passport to verify that the unit is entering and leaving with you.

The United States Council for International Business provides *carnet* documents to aid the transport of computers and other business machines across the borders of about 40 participating countries, most of them in Europe. The carnet must be obtained in advance of travel by application to the Council, and serves as a passport for the machine.

Erica Zeidenberg, who arranged carnets for Perfect Software's sales force on a recent trip to Europe, says the process is "pretty much of a headache," but worth it in the long run. With the carnet, border crossings generally go smoothly, although travelers should be prepared for occasional delays, particularly when traveling by train. "Once you recognize that delays are a fact of life," Zeidenberg says, "you don't have any problems at all." Carnets cost $100 per year for equipment valued between $500 and $5000, and the applicant must provide a

The Epson, a modem, and a recharger can all fit in one side of a briefcase.

makes bubble memory cards for Apple computers, claims that the bubble makes the Apple practical on dusty construction sites and in private or military planes.

Up-front thinking

Some companies are using portables to consult on-site with clients. They gain an ability to gather data more easily and render services previously considered prohibitive. Stuart Harmon occasionally takes an IBM-compatible Compaq computer with him when he's representing the national accounting firm of Arthur Andersen & Company. He's an experienced senior accountant in AA's San Francisco special services office. Harmon recently helped a San Jose electronics company improve its profitability. The firm supplies the federal government with a variety of products from several divisions, but lacked a sophisticated system for allocating costs. It needed detailed allocation in order to judge profitability on specific products. Harmon's job was to present alternative systems of allocation.

security deposit equal to 40 percent of the declared value.

If you're traveling overseas, you should also smooth the way for your re-entry into the United States by registering your computer's serial number wth U.S. customs. This is particularly important when the equipment is of foreign manufacture.

Even when you're traveling closer to home, there are some problems to deal with. Canadian free-lance writer Tim Perrin says that an American customs official had no trouble with his Osborne computer, but objected to his bringing his Japanese-made Epson printer. Perrin had registered his equipment with Canadian customs previously, though, and the U.S. official eventually let him in when he showed the Canadian customs registration.

If you want to take a personal computer into Canada on a temporary basis, you must deposit with Canadian customs an amount equal to duty and Canadian taxes on the computer. The deposit must be made in cash or certified check, and is refunded by mail after the computer has been returned to the United States. The carnet certificate is also valid.

"I was able to bring the portable computer down to the client and manually key in the relevant cost data there, then develop other alternatives to format this data, and so see the profitability of each division and how the costs were moving," he says. He used mainly SuperCalc and Lotus 1-2-3 software to do the job.

The project lasted about two months. Roughly half of that time went into learning the client's activities, product line, accounting system, etc., and deciding what steps to follow. Harmon stresses that the use of a computer on-site increases the need to determine up-front as much as possible what the outcome is going to be. "If you're going to use the data to study a range of alternatives, or if you're using the data over an extended period of time, then the initial work of keying in the data is probably worthwhile. Otherwise it may not be."

By alerting customers to the use of computers, especially those readily compatible with its own systems, Arthur Andersen helps itself as well. The portables are an extension of a broader company system that includes IBM Personal Computers tied in with mainframes, and Harmon needn't rely on the Compaq when he wants more memory, more programming, or simply a larger screen.

It is the transportability of the Compaq that is valued chiefly in Arthur Andersen's overall national objective of "automating the audit." Still, Harmon acknowledges that "Basically we didn't move the computer around that much." Once at the client's offices, the Compaq stayed there most of the time. Harmon did sometimes take it home to work on weekends, but to say, as he does, that the 28-pound Compaq is "no bigger than the normal audit bag we carry our work files in" is as much a comment on the bulk of an accountant's sizeable briefcase as it is on the small size of the portable.

Befitting its methodical nature, Arthur Andersen recommends caution in moving its portables. The conservative guidelines of its Portland office require that the Compaq travel inside another case lined with an inch of foam padding, and prohibit carrying it in the trunk of a car where heat or a rough ride may cause damage, or leaving it for long periods in a closed car where heat accumulates.

No place like home

While Beard's far-flung computing and Harmon's heavy business use show off the range of portable computer capabilities, most personal computer users can boil the issue of transportability down to one practical question: Can I take my work home? Here, moving a computer may in, too. The next time he went to La Jolla for a seminar, she also went as a member of WBSI.

The effect, McMahon says, was "absolutely the reverse of our prior experience." Trish became excited and personally involved, and is now using the Kaypro to prepare the dramatic literature courses she teaches at Holy Name College.

As outsiders, we may think that the strained domestic relations caused by McMahon's need to work out his own discomfort with the computer world could have been avoided, but it's hard to foresee the social implications of moving a computer into what's supposed to be "familiar" territory. Perhaps especially when the computer becomes a telecommunicative link, its local impact shouldn't be underestimated.

McMahon is having an IBM Per-

(continued on page 202)

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NewWord's versatility includes ***merge print,*** which allows you to produce customized form letters and reports by combining standard and individualized text. Information stored on one disk or file can be transferred automatically to another, perhaps merged with financial reports and graphics. Using ***NewWord,*** you can merge mailing lists into form letters and print mailing labels.

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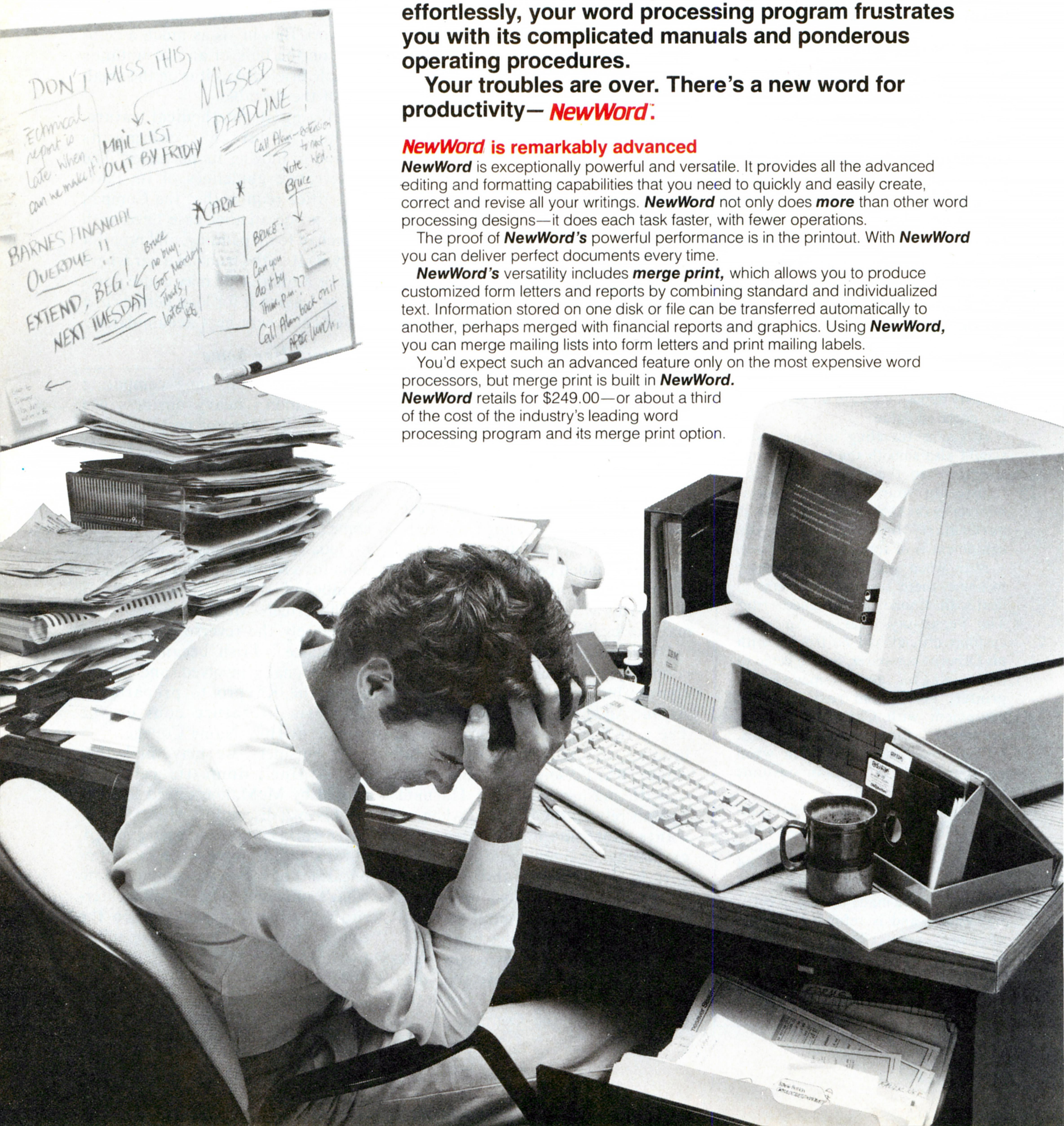
NewWord retails for $249.00—or about a third of the cost of the industry's leading word processing program and its merge print option.


DON'T MISS THIS
Technical report is late. When can we make it?
MAIL LIST OUT BY FRIDAY
MISSED DEADLINE
Call Alan—extension to next wed?
Vote Bruce
CAROL
BARNES FINANCIAL OVERDUE !!
EXTEND, BEG!
NEXT TUESDAY
Can you do it by Thurs. p.m.??
Call Alan back on it after lunch
IBM

are over for efficiency

NewWord makes you productive right away

You can put ***NewWord*** to work immediately, without feeling awkward or confused. Anyone with WordStar® experience won't even have to read ***NewWord's*** manuals. WordStar® text files work with ***NewWord.*** Start writing, using the same commands as WordStar®. ***NewWord's*** high-powered performance and versatility will be immediately apparent.

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NewWord makes paperwork easy

Editing is easy and straightforward with ***NewWord.*** Single keystrokes perform primary functions, such as to insert, delete and move characters, words and sentences. ***NewWord*** obeys your instructions instantly, making corrections and revisions easy—like using the convenient "unerase" command when you change your mind. Or finding a specific page in the document.

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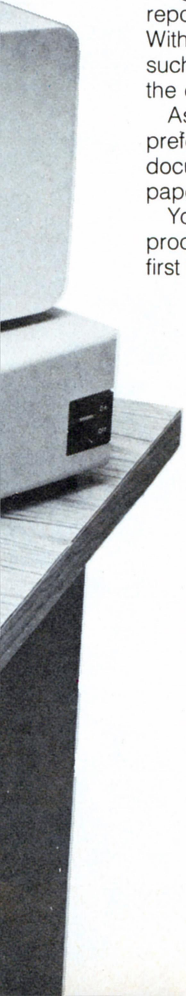
You'll be pleased by how much less effort it takes to produce perfect, professional-looking documents—even for a first time user!



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"Save and resume" command doesn't move the cursor to the beginning of the file, eliminating another frustration typical of the other program. "Living" ruler lines automatically change margins and tab stops for you as you move around the document.

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CIRCLE 14

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CIRCLE 108

Environment Software: Opening New Windows on Your Work

The newest generation of productivity packages give you a way to keep a sharp eye on the big picture while you're dealing with the details

by Kevin Strehlo, Associate Editor

Multiple-window displays, integrated software, the mouse, and high-resolution graphics, all combined into something called an operating environment, are being touted as revolutionary—but so were the rotary engine, 3D movies, and Quadraphonic sound. Is this new way to communicate with a personal computer—exemplified by Apple's Lisa and Macintosh, VisiCorp's Visi-On, and Microsoft's Windows, all of which attempt to make working with the computer as natural as working with pen and pencil at a desk—going to result in the kind of fundamental advance we witnessed with the move from telegraph to telephone? Or is the mouse and all that goes with it more like the ill-fated Picturephone, something we'll hear about for a while, only to have it disappear because although it was very impressive on the surface, it wasn't very useful?

Those who have experienced the new environments tend to agree with the researchers who took hundreds of man-years to develop them, that what we have here is indeed a significant advance, as important and substantial a change in the way we go about computing as was the move from batch processing of punch cards to

Operating environments such as Apple's Lisa (right) promise new computing power by integrating multiple functions in one user-friendly machine.

Photo by George B. Fry III

interactive computing via a video screen. Currently, only Apple's Lisa has a sizable number of users with extensive experience in this new kind of interaction with a personal computer, but if the experience of Lisa users can be extended to the competing products that are just beginning to enter the market, it's safe to say this: seeing, pointing, and clicking is believing.

Lisa on Montgomery Street

Gregory Kelsey, a senior analyst at the venture capital and investment banking firm of Hambrecht and Quist, is nearing the end of a very busy day in his office above the teeming streets of San Francisco's financial district. Most of his work has been concentrated on writing a report to clients about the IBM PCjr, which was introduced that very day in New York. The monitor of his Lisa desktop is crowded with documents, visually overlapping the way pieces of paper would on a real desk top, that pertain to the day's effort—notes from various phone conversations he's had with contacts inside his company, at IBM, and at IBM's competitors sit stacked below, with the report in progress sharing the top of the pile with a bar chart of the various personal-computer makers' market share. But the world doesn't stop just because IBM does something, and Kelsey has a client on the phone with a request for information on Eagle Computer.

Without putting away the documents pertaining to the PCjr, Kelsey slides a mouse across the desk until the arrow-shaped cursor on the screen points to a small line-drawing of his Profile hard disk. From there what happens is difficult to follow, just because Kelsey does it so quickly and assuredly. Simply by pointing the mouse and clicking it, menus pop down, a picture of a Profile hard disk opens up to reveal pictures of folders, one of which is labeled Company Summaries. This opens to reveal a

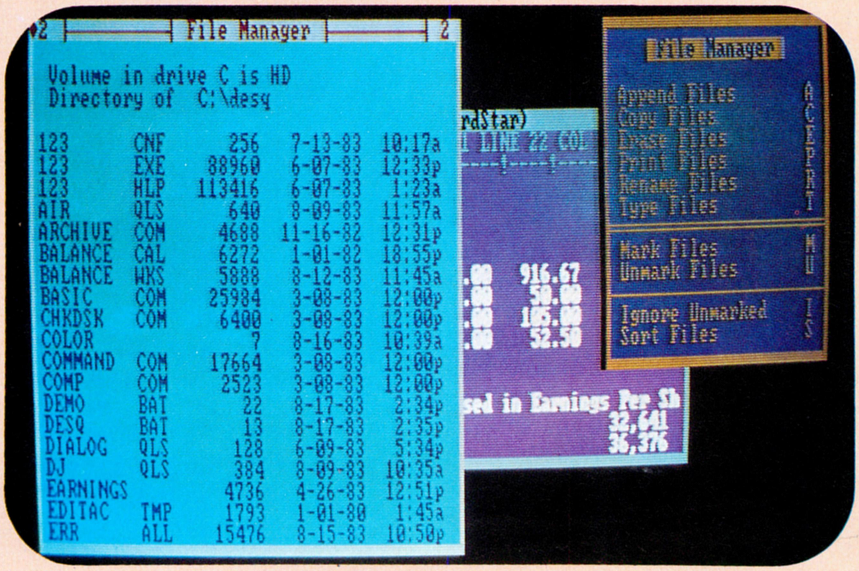
INTEGRATED OPERATING ENVIRONMENTS

Apple's new Macintosh transportable computer provides most of the features of Lisa's integrated operating environment at a price low enough to greatly increase the number of people who do their personal computing on the electronic desk-top. Macintosh implements the "look, point, click" interface with windows, a mouse, pull-down menus, high-resolution graphics, and software integration. Moving from one Macintosh application package to another will cause the first application to be saved to disk to make room for the second, however, and the ability to print while continuing to work is also absent.

While both Apple offerings tie the integrated operating environment to specific hardware, several software developers are offering similar capabilities on a variety of computers. The old man among these is VisiOn, which currently runs on the IBM XT, but will soon be available for several other MS-DOS machines. Like the integrated operating environment on Lisa, VisiOn requires a hard disk and a lot of main memory (512K), and currently runs only a few application packages. VisiCorp's $1795 price tag for the complete bundle of VisiOn, VisiOn Word, VisiOn Calc, and VisiOn Graph puts an IBM XT running the VisiCorp integrated operating environment in the same price range as Apple's Lisa.

There are other software packages that provide some, but not all, of the characteristics of the operating environment as first defined in Xerox PARC. DesQ from Quarterdeck, for example, divides the display into windows, handles transfer of information between different programs, and provides for input from a mouse-pointer. It also has the advantage of running standard MS-DOS software on an IBM Personal Computer with 256K bytes of RAM and a 5Mbyte hard disk or on an IBM XT, and it provides transfer of data between at least some of these standard software packages.

Potentially the most interesting integrated operating environment is Microsoft Windows, an extension of the MS-DOS operating system that displays multiple files in separate windows on the screen, and offers a mouse pointer, pull-down menus and bit-mapped graphics similar to those of Lisa and Macintosh. The large number of MS-



```
Volume in drive C is HD
Directory of  C:\desq

123       CNF     256   7-13-83  10:17a
123       EXE   88960   6-07-83  12:33p
123       HLP  113416   6-07-83   1:23a
AIR       QLS     640   8-09-83  11:57a
ARCHIVE   COM    4688  11-16-82  12:31p
BALANCE   CAL    6272   1-01-82  18:55p
BALANCE   WKS    5888   8-12-83  11:45a
BASIC     COM   25984   3-08-83  12:00p
CHKDSK    COM    6400   3-08-83  12:00p
COLOR               7   8-16-83  10:39a
COMMAND   COM   17664   3-08-83  12:00p
COMP      COM    2523   3-08-83  12:00p
DEMO      BAT      22   8-17-83   2:34p
DESQ      BAT      13   8-17-83   2:35p
DIALOG    QLS     128   6-09-83   5:34p
DJ        QLS     384   8-09-83  10:35a
EARNINGS         4736   4-26-83  12:51p
EDITAC    TMP    1793   1-01-80   1:45a
ERR       ALL   15476   8-15-83  10:50p
```

```
.00    916.67
.00     50.00
.00    105.00
.00     52.50

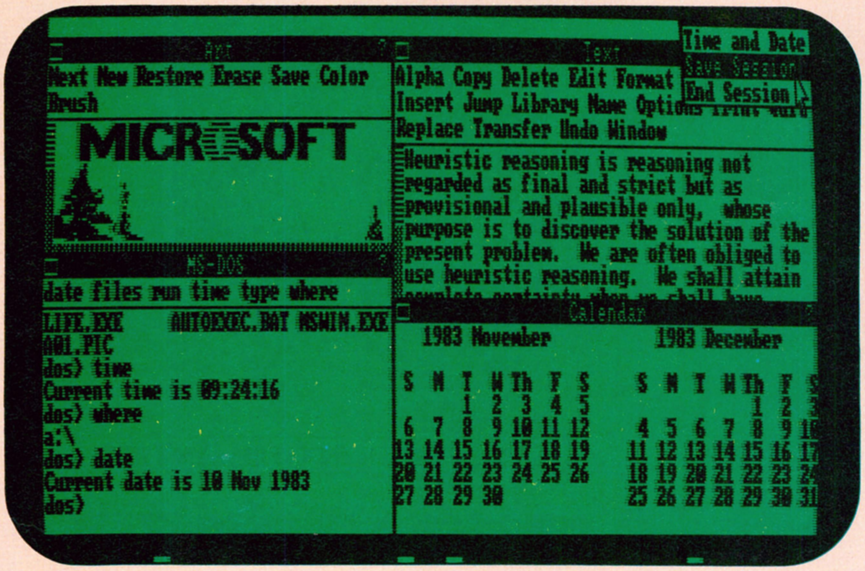
sed in Earnings Per Sh
                32,641
                36,376
```

The DesQ integrated operating environment includes File Manager (left) and WordStar (center). The menu for File Manager appears at the right of the screen.

Lisa's simulated desk top takes the clutter out of paper shuffling.

DOS computers means it has a huge installed base. Windows will be made available on new computers from the companies supporting it, and as an upgrade to people using MS-DOS version 2.0 or higher who have machines with at least the 192k bytes of RAM required to run it. The more RAM you have, of course, the more applications you can have stored in memory at once. There are differences between the Apple desktop and the one implemented by Microsoft Windows, of course. Instead of Lisa's approach, in which a newly opened application window is laid on top of applications already up on the screen, and can be resized and then rearranged like a piece of paper, Windows does something Microsoft refers to as "tiling." All open files are displayed on the screen at once in a two-column format and windows never overlap. You can change the height of the windows, but not the width—the two-column format is fixed. As you open or close a file, the remaining windows on the screen are automatically resized to compensate. When you activate a window, it expands to fill the entire screen.

While personal preference determines whether Microsoft's tiling approach to window management is an advantage or disadvantage, there is no question that it's value goes beyond windowing and a mouse-driven user interface. A major achievement of Windows is that it provides portability between different MS-DOS computers. Until now, application programs were left to deal with many hardware-specific characteristics of different MS-DOS computers. Since different machines handle such functions as the reading of keyboard inputs or the display of information on the screen differently, software developers had to write a special version of the software for each computer, which accounts for the great number of machines striving to be identical to the IBM Personal Computer. But Windows buffers the application program from the specifics of the hardware by handling the hardware interaction itself. Thus, any application program written for the Windows environment will run on any other computer that is equipped with Windows. There will be no need for different versions of WordStar for the TI Professional and the Compaq, for example, once that package is converted to run under Windows. Currently, the Microsoft interface manager is being supported by some 23 personal computer manufacturers.


Art
Next New Restore Erase Save Color
Brush
MICROSOFT
Text
Alpha Copy Delete Edit Format
Insert Jump Library Name Optio
Replace Transfer Undo Window
Time and Date
Save Session
End Session
MS-DOS
date files run time type where
Calendar

Heuristic reasoning is reasoning not regarded as final and strict but as provisional and plausible only, whose purpose is to discover the solution of the present problem. We are often obliged to use heuristic reasoning. We shall attain

```
LIFE.EXE      AUTOEXEC.BAT MSWIN.EXE
A01.PIC
dos) time
Current time is 09:24:16
dos) where
a:\
dos) date
Current date is 10 Nov 1983
dos)
```

```
 1983 November           1983 December

S  M  T  W Th  F  S     S  M  T  W Th  F  S
      1  2  3  4  5                 1  2  3
6  7  8  9 10 11 12     4  5  6  7  8  9 10
13 14 15 16 17 18 19   11 12 13 14 15 16 17
20 21 22 23 24 25 26   18 19 20 21 22 23 24
27 28 29 30            25 26 27 28 29 30 31
```

Microsoft's Windows illustrates the concept of integrated operating environments with graphics, word processing, and calendar functions on one screen.

picture of a piece of paper labeled Eagle Computer which grows and solidifies to fill the screen. Now Kelsey moves the mouse and pulls down the Search menu by holding down the mouse button, highlights and selects Find What, types the phrase "long-term prospects," and suddenly that section of the document is visible and Kelsey is referring to it to answer the client's questions about the probable course of Eagle's stock in the future. After several more searches—more mousing to open a LisaCalc document labeled P/E Ratios that he had updated with current stock prices that morning—Kelsey says good-bye and hangs up.

Kelsey decides his desk-top, stacked deep in documents, needs cleaning up, so he selects the Set Aside Everything option with the mouse and one by one Lisa closes down documents, arranging their icons in neat rows. When Lisa is done, Kelsey clicks twice on the document labeled PCjr Report, and drags the lower-right corner of the document up with the mouse so the window is smaller. He drags the elevator icon to the bottom to get to the bottom of his report, opens up another document to get the phone number of his personal accountant who happens to be an avid IBM follower, tears off a sheet of LisaWrite paper, and as he waits for his accountant to answer his call he arranges it to fit the bottom portion of the screen. When the call comes through, he reads the question he has posed in his last paragraph to his accountant, and begins taking notes as his accountant offers a possible answer.

"I try not to have more than three or four things open on my desk top at once," Kelsey explains after he has finished his report and printed it out. But handling more is obviously quite possible when Lisa is doing the paper shuffling for him. Without Lisa, Kelsey would probably have been so swamped in notes and folders pulled to deal with that day's normal affairs

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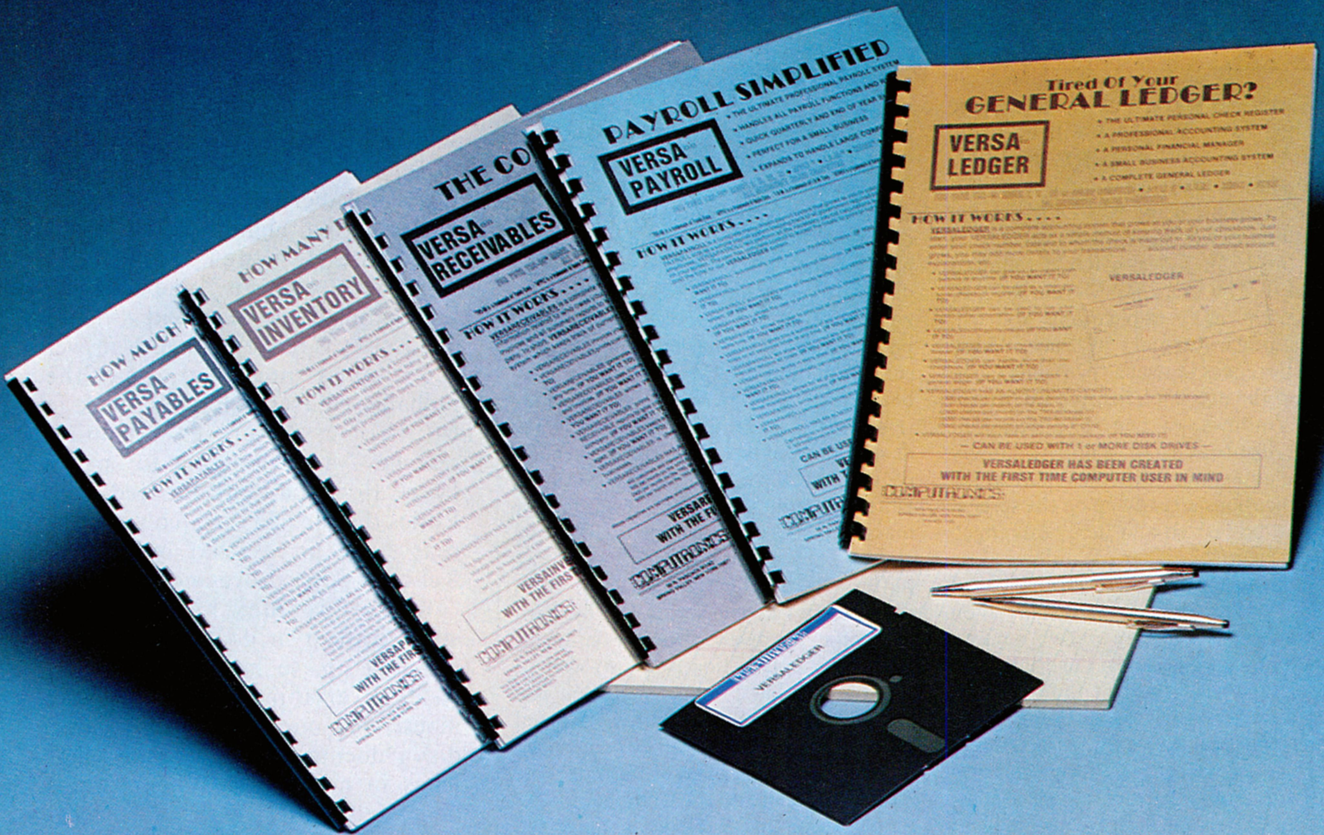

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A major advantage of Windows is its portability between different MS-DOS computers.

that he would just be starting his special report on PCjr.

Although Kelsey's easy facility with Lisa and ability to turn around such a complex analysis without the aid of a secretary seem to suggest he is an old pro at both personal computing and typing, it isn't so. He had never used a computer before the introduction of Lisa less than a year prior, nor had he worked on a keyboard.

"It's funny, because I was the one responsible for buying the first personal computer we had here," he explains. "But back then my assistant was the one who actually used it." The original idea had been that his assistant would do the brute force work, entering data and getting the first cut of a spreadsheet done so that he could fine tune it. But after one or two days it became apparent that Kelsey was never going to work directly with the machine: He simply didn't have the time to spend hours becoming familiar with VisiCalc commands. "I already work 60 or 70 hours a week," he says. "It would probably take me 20 or 30 hours to get up to speed on VisiCalc. And if I went away for a week, which I often do, I would probably have to spend 10 hours with it again just to get back to where I was."

The difference between his resistance then and his enthusiasm now, says Kelsey, is how easy Lisa is to learn. "I understood how to use the machine in a few hours. Without having to learn anything tougher than how to use the mouse, without learning *any* commands, I was able to become proficient," he explains. "I received a half-hour demo at Apple before I took delivery, then went through the tutorials on two or three applications, and felt like I knew it. It's so intuitive. And when I came back later, the icons and prompts guided me through."

Just as important however, he can move quickly from one computing task to another. An ordinary day on the job might find Kelsey shifting focus as many as a hundred times. If for only five of those 100 shifts of attention he had to exit the program he was using, save the file he was working on with some arbitrary command, and then boot up another program with a new set of commands and way of doing things, it is questionable that the effect would be to *increase* his productivity.

The principles of ease of use

The keys to the kind of intuitive, simple user interface that converted Greg Kelsey to the ranks of the believers are captured in four principles that served as the guidelines not only for the team that designed the ground-breaking Xerox Alto experimental workstation, upon which Xerox based their commercially disappointing Xerox Star, but also for the developers at VisiCorp and Microsoft who designed the VisiOn and Windows operating environments, respectively. Simply because we are focusing on Lisa, we will elaborate on the rules in terms of Lisa's office system software.

The first principle of these new operating environments is that the user is not asked to remember commands and then type them. Instead, he merely looks, points, and selects. Thus, when you want to edit a document on Lisa, you point to it with the mouse, then click, then point to the edit menu, and click once again.

The second point is related to the first: The user should be presented only that information which is relevant at the moment. Because the user must look for and point to the command he wants to execute and the object he wants the command to effect, it is important to minimize the amount of looking he has to do. If the user has opened a LisaWrite document, for example, the menu lists only commands used by LisaWrite. Taking a stab at what he wants to do by pointing to and selecting a possible action from the menu bar—say Search—causes another menu to be pulled down. Moving the mouse then highlights each Search option one by one. Simply look, point, and click.

The third key is consistency across domains. No matter whether the user is rummaging around the desk top, working on a spreadsheet, or editing a word-processing document, the way he does things has to be consistent. "Look, point, click" always works for selecting options on Lisa, and it always works in the same way, so you can "cut and paste" one section of a document to another. Whether you're editing a report in LisaWrite or a picture in LisaDraw, you use the mouse to select the portion to be cut; when it's cut it disappears off the document you're working on and goes to the clipboard, and from there it can be pasted into another document.

The fourth principal is the old adage, "what you see is what you get." While this may not have such an obvious impact on ease of use, anyone who has tried to determine what a word-processing document full of dot commands will look like when it's printed (and had to reprint it when the result was different than desired) will appreciate the potential of the concept. You can use LisaDraw to create graphics and illustrations, and you also have the ability to create textual presentations of a quality normally associated with typesetting. Anyone who has worked with the complex encoding required by most phototypesetting machines, and experienced the headaches of paste-up and printing, will appreciate the simplicity of Lisa's high-quality text reproduction: You simply select Print from a pull-down menu to achieve faithful reproduction of the screen image on paper.

Beyond ease of use

"If you take away ease of use—and after practice ease of use is less an issue—the big plus of a system like Lisa is integration," says Rick Wohleber, a project manager for

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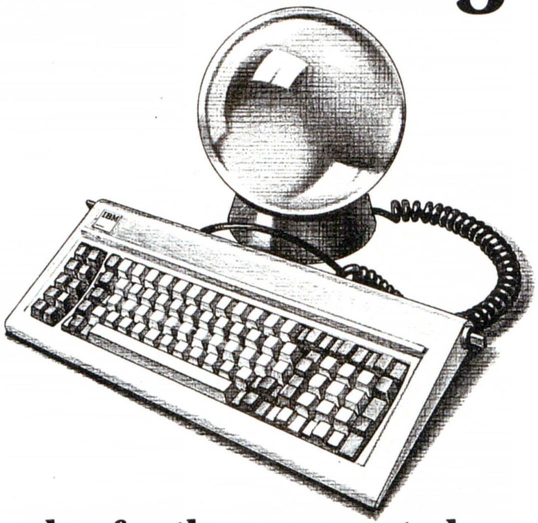

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Users can become skilled in the new environments without having to learn commands.

Rockwell International's microwave division in Richardson, Texas. "The ability to move data from spreadsheet to a graphing program to word processing is the primary advantage," he says.

Wohleber says that he had devised a form of integration on the Apple III he used before his Lisa arrived. "I'd go from VisiCalc into Business Graphics or Applewriter, but not easily. To do it you have to understand graphics commands, and file structure, and subroutines, and even then it takes a lot of time." So much time that he only did it for his annual presentation. "But on Lisa, it is so easy that I can go from LisaCalc to Graph to Write in five minutes. Now I do it for every presentation I do, and I'm much more effective. Now *all* my presentations have real impact."

A question of power

The key element of these new environments, and the part seasoned computer users find hardest to accept, is that they are richer in function at the same time they are easier to use. The Dallas-based Simtec chain of retail computer outlets emphasizes this apparent contradiction by teaching an intensive three-day seminar it calls LisaCollege on the use of what the syllabus calls "the most versatile, powerful microcomputer available today." But if Lisa is so easy to use, why three full days?

First, remember that ease of use is a relative term. Greg Kelsey is not alone in estimating the time it takes to get up to speed on VisiCalc at 20 to 30 hours. Thus it is actually quite impressive that Simtec takes only 24 hours for an exhaustive tutorial in the use of the operating environment and all five of Apple's Lisa application packages as well as simulated "slice of life" case studies. Another way to look at it is that the 20 hours spent learning VisiCalc would teach you only how to work that single tool. In 24 hours of LisaCollege, you learn not only about five tools and how they work together, but how they can be used to solve real-world business problems and complete projects on schedule.

John Dunn, Simtec's director of education, says a focus of LisaCollege is to get the student accustomed to thinking about Lisa's application packages as an integrated whole rather than as individual tools, because they feel that ". . . only through this integrated approach can you gain full facility in applying Lisa's power."

And how does LisaCollege envision applying that power? In one of the case studies, the president of the mythical company for which each student is working wishes to evaluate the feasability of acquiring a certain software distribution company. LisaDraw is used to "enhance financial evaluations" prepared earlier in the course using LisaChart and LisaGraph into "highly presentable graphic representation." LisaWrite is used to prepare correspondence regarding the merger, and LisaList is used to begin the process of reconciling the distribution company's accounts payable.

For now, a trade-off

As with many things in the world of personal computing, there is a down side—a trade-off—to the advantages gained with the new environments. The problem is that the things going on beneath the surface of Lisa's desk top to effect its integration and slick user interface are incredibly complex. Yet because the advantages of such integration are so immense, companies are taking the time to develop software for the Lisa. And even though Apple has opened up the code that accomplishes Lisa's windowing, graphics, and data transfer—in effect pointing out where the hooks are and inviting third-party vendors to hitch up for a free ride on some very expensive software development—it was over a year before the first of these packages were ready.

To the user, this is probably the biggest drawback to the new environments: a paucity of application packages that run under them. A number of software firms are working hard to finish applications for Macintosh at this very moment, for example, but some won't be ready for a year or more. Even Microsoft, which has worked with Apple on the Macintosh project for the past two years, had only two software packages ready to ship on the day Macintosh was announced. The story of VisiOn is a further case in point. Not only has no one beside VisiCorp shipped a package that runs under VisiOn, but even VisiCorp could not finish all of its VisiOn application packages despite the year between announcement of its application environment and it's first shipments.

What does this do to the user? It makes him feel reluctant, or unable to even consider the new environments until sufficient application software is available to run under them. Wohleber says that despite the richness of the Lisa office system, for example, many people in large corporations have shied away because of the lack of a powerful data-base management system. "I'd give a lot for one," Wohleber says. "I'd even slip my mouse into the drawer for a few minutes, if I had to, " he continues, "although those less technical than me, who rely on the ease of learning and ease of remembering that comes out of Lisa's interface, would probably disagree." He admits that he'd soon wish such a data base was integrated under the desk-top, but it's a yearning he could live with. "A database management system is just too crucial to go without," he says, "even if it meant pasting tables into a report. It's better than doing the tables by hand or not at all," he says. Fortunately, Apple demonstrated several data-base management packages for Lisa at the end of 1983, and if they aren't already shipping they will be in the near future.

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Manage Your Information.

HQ just called. For 1984 they want revenues of 10 million and profits of 1 million. They want the sales history and a forecast—today—in Chicago.

I waste no time. With the information manager, I quickly combine and retrieve information from the (1) sales department file, (2) marketing department file, and (3) manufacturing department file. With the push of a button, it all gets sent to the electronic spreadsheet.

Project the Figures.

Inside the spreadsheet, I must now calculate the sales volume and advertising expenditures to meet HQ's 1984 goals. But, if I can play the "what-if" game, finding the right combination of figures could take hours.

Luckily, the spreadsheet I'm using has Goal Seeking. This way, I can enter my two target values and let the spreadsheet calculate the right combination of sales volume and advertising. This way, I know I've got the right values—

Graph Your Results.

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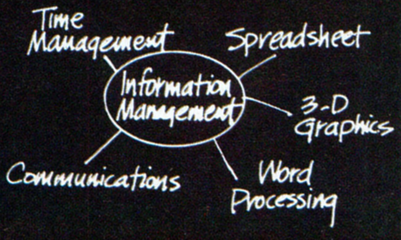
I've learned that HQ doesn't like wading through reports to get the bottom line—they want to see it as clear as day. So, I'll move the spreadsheet results directly into the graphics module. In a few keystrokes I have a mountain of raw data distilled into a bright, three dimensional color bar graph.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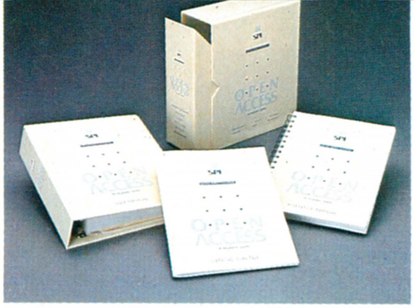

Write Your Summaries.

Fortunately, this word processor is powerful enough that I can quickly call up last year's sales report, edit the changes, copy in the spreadsheet model, and include a command to print the graphs at the end of the report.

Now, I can rewrite the critical lead paragraph to get the wording just right, perform a global search and replace to update the year, and block margin the paragraphs for a professional appearance. 9:43 am. Finished!

Communicate With Your Offices.

After a quick review of all the work done, I thank my lucky stars for the powerful communication module. This allows me to simply display HQ's phone number from a list and with the push of a button, my intelligent modem calls the number. Then, a few keystrokes and—zip—I've sent it all to Chicago by electronic bit stream. Time 10:47. I just saved 4½ days!

And Still Keep Your Appointments.

I expect the quality of this report to raise some eyebrows at HQ. So, I'll schedule the rest of today off since I've already finished a week's work. Fortunately, my appointment scheduling system reminds me of my dentist appointment at 4:30. I'll also schedule a briefing at 9:00 am tomorrow for the sales staff and my secretary can use the rotary card file to call everyone on the list. Well, I'm off for the golf course—Good-bye!

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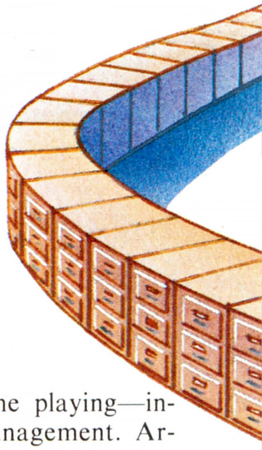
How to Buy Data-Base Software



You're going to buy a data-base management package. The question is, which one?

by David Gabel, Senior Editor

The salesman isn't very convincing. You've been listening to him talk about data-base management packages for quite a while, but he still hasn't said anything you're interested in hearing. The only reason you're even hanging around is because, having seen and heard everyone and everything on the subject, you just *know* it could do something for you. You're not sure what, but you know it can do something. And if you give this guy enough time, he's bound to hit upon something you'll like. He keeps talking about hierarchical versus relational data bases, and programmable systems based on powerful query capabilities. It's all very impressive, but you just want to figure out what good the darn thing will be *for you*.

You may not be asking for much, but don't expect miracles. Data-base management is an abstract concept; that's why you have trouble figuring out what good it is, and why salesmen have trouble explaining it in terms you want to hear. "Data-base management is a hard-to-talk-about thing," says George Lechter, vice-president and co-founder of Alpha Software in Burlington, Mass., which publishes two data-base management programs—Data Base Manager II and Alpha Base V. "Word processing," Lechter continues, "is easy to talk about, and so is spreadsheeting. The words "what-if" and lots of ads have helped position spreadsheets. But data-base managers— that's different. Basically, whenever you have a list of anything you need to keep track of, you need a data-base manager."

Philip Ingebo, president of Condor Computer Systems in Ann Arbor, Mich., has his own view: "I view a computer system as composed of three components—the hardware, which is the wires and silicon, the data, all the information you're working with, and the data manager." This conception is in sharp contrast to the ordinary description of a computer system—hardware and software. "Now the data manager," Ingebo continues, "contains three capabilities: a repeating-records manager, a string-records manager, and I/O routines. Repeating records are things like your to-do list, or your personnel file. String records are words, and a word processor is an example of a string-records processor. I/O routines simply provide a means of inputting and presenting data in ways that are useful."

It's no surprise that Ingebo's company sells a data-base management package that incorporates this view of computer systems. It *is* a surprise that his global view can lead you to understand what a data-base manager really is.

Following what he says, you can see that everything you do on a computer—even game playing—involves data-base management. Arcade games, for instance, need a repeating-records manager that stores and retrieves the screen display, and I/O routines to convey the data representing the screen image to the display device, where they are presented in a useful form. Word processors store the words that are input, usually on disk, employing their string-records managers. Spreadsheets do the same, and so do vertical applications programs, like tax-computation and accounting programs.

Why, then, do we have so many generic programs that are called data-base managers if everything, in the most general sense, employs a data manager? If data-base management is what computers do all the time, why have programs that are specifically called data-base managers?

A throwback

Data-base management, as a general term, is a reflection of the data-processing industry. "A data base," says Fred Gibbons, president of Software Publishing Corporation, which publishes PFS: File and PFS:Report, "is a neat way of keeping data in one place and accessing it in a number of ways with programs." Data bases are MIS (Management Information Systems) managers' constructs. All of a company's data can be collected in one place, called a data base, and then specialists (programmers who respond to the MIS manager, not the user of the data) can devise ways to access and manipulate the data. A data-base manager is simply a tool that's used to change—or update—the data, then collate that data to produce reports.

That's fine on a corporate level—but what about the personal-computer user who doesn't have that kind of data to keep track of? In order to understand what data-base management on a personal computer is all about, you almost have to take a global view of computers and what they can do. In essence, computers only manage data. Some of the data they manage is numerical, and they can massage it in some very nice ways. Some of the data is alphabetical, and they can move it around, recompose it, reshape it and so forth. But no matter what you call it, it's still data.

People who use personal computers aren't terribly interested in data-processing activities. They're interested in getting things done, and getting them done quickly and easily. They don't care about how data bases and data-base management work, or at least they shouldn't. They care about data, and about getting it into the computer so they can manipulate it and get it out again to use it.

So while some publishers talk about their data-base management programs, the personal-computer user, like the hypothetical buyer in the beginning of this report, tries to figure out what he can do with the program. He's confronted, on the one hand, with statements like, "Well,

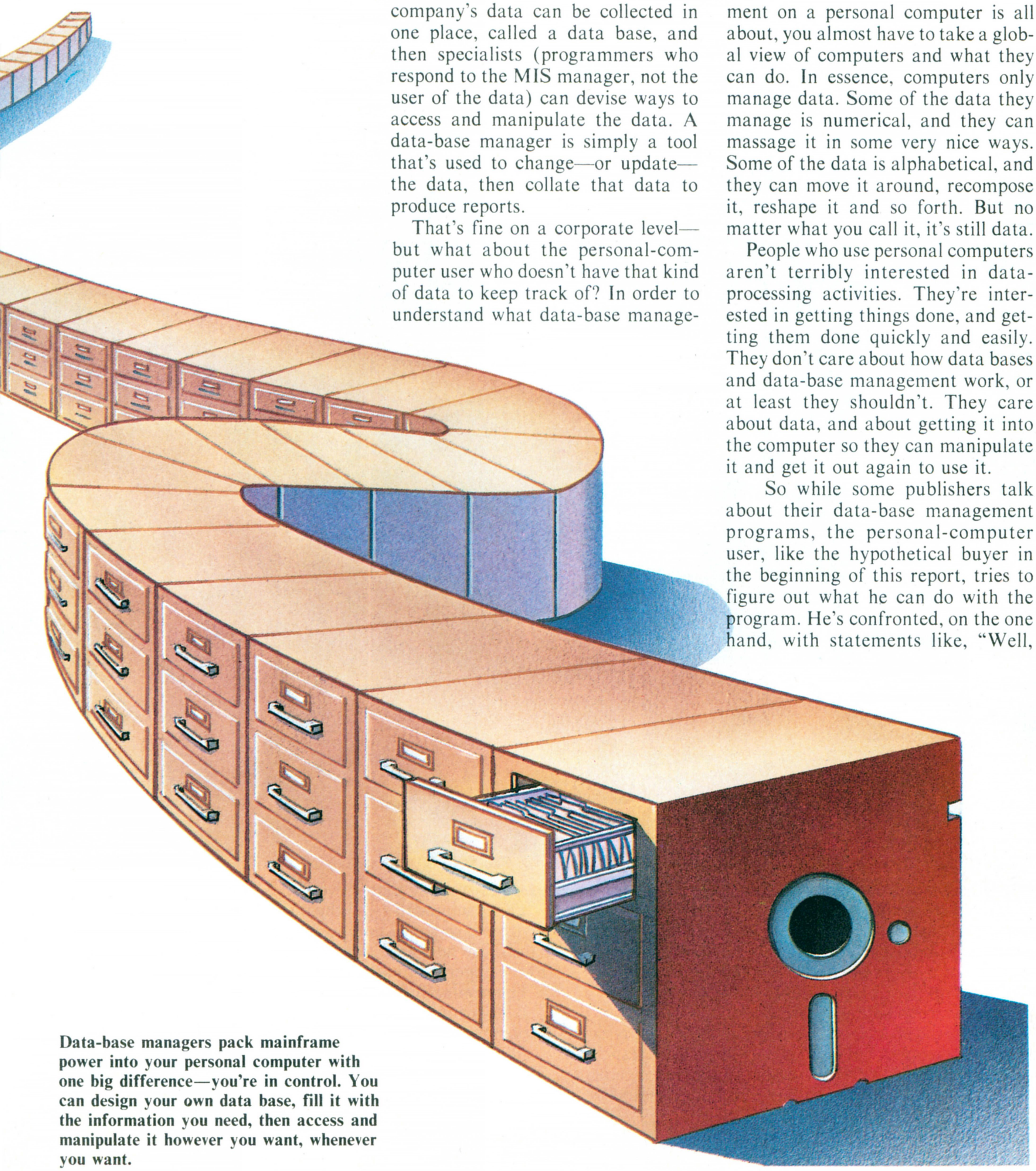


Illustration by Josie Yee

Data-base managers pack mainframe power into your personal computer with one big difference—you're in control. You can design your own data base, fill it with the information you need, then access and manipulate it however you want, whenever you want.

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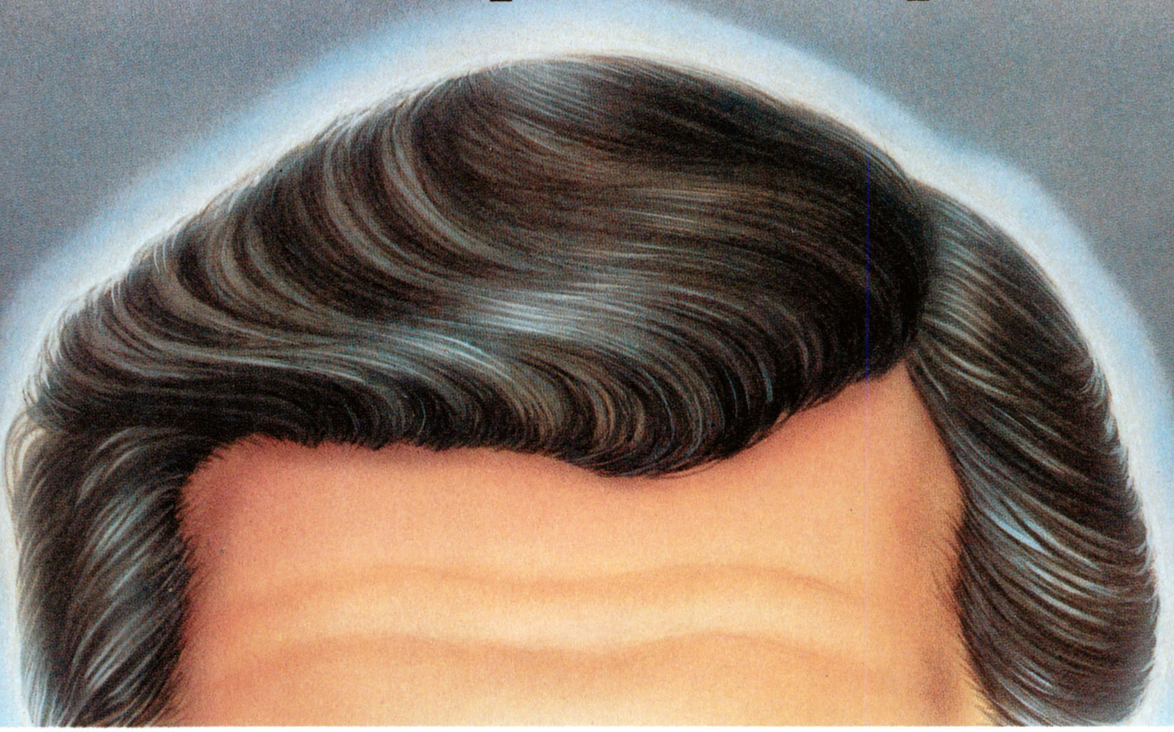

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Everything you do on a computer—even game playing—involves data-base management.

this program is *only* a filer," and on the other hand with, "If you use this program, you'll have to learn to program it," or "Now I have this other program here that teaches you how to program this first program."

The light at the end of the tunnel

Believe it or not, there is a way out of this dilemma. We need to forget about terms and talk about function. Then, once we have function down, we can get back to the terms. That makes sense, because many people don't agree on the terms anyway.

To help make the function clear, let's construct a mythical personnel department. Our personnel department consists of a manager and a clerk, and these two people handle all the personnel activities of a small company with 100 employees. It maintains the records for all 100 people, and each person's records are kept in separate folders. The jackets contain the original job applications, resumes, the results of any pre-employment tests the employee took, supervisor evaluations, insurance forms the employee filled out, salary records, and other forms the company thinks are pertinent.

Every month the company president requires certain reports from the personnel department. He wants to know, by department, the following information: Who is due for a salary increase; who is about to lose vacation time because it can't be carried over to another year; who is taking how much sick leave; and who received either outstanding or below-average supervisor evaluations within the last month.

To get the reports done, the personnel manager, of course, relies on a clerk who, being a wise clerk, has organized his files so that he can generate all these reports in only one day. Not only that, but he can also prepare carbon copies of these reports and send them to the department managers; department managers do appreciate knowing what the boss knows.

Well, the system works fine until the company president decides he needs a *different* report. This time he needs a listing of all company employees organized by date of last salary review, including present salary, last increase, and last increase as a percent of former salary. By the way—for a given date, the salary increases have to be sorted from highest to lowest.

The personnel manager, of course, passes this new requirement along to the clerk, who mumbles about presidents who don't know what they want and then gets to work. Generating the report takes about five days, because the files aren't organized for a report like this. Since all the other reports are arranged within departments of the company, the record folders were filed that way. That means the salary increase forms have to be pulled from each file and sorted for the company by date and then by size of salary increase within the date. Then percentage increases have to be calculated and the results transferred to a worksheet. Finally, the figures have to be transferred from the worksheet to a typewritten sheet, which has to be approved by the personnel manager, with revisions, before it's sent out to the president's office. Last but not least, all the salary increase forms have to be refiled in their respective folders which then have to be refiled in their original order so they're ready for the next month's ordinary reports.

Computers do it differently

The clerk in this simple example was the data-base manager, and the collection of personnel records was the data base. Notice the function of the data-base manager. He puts data into the data base, updates the data, retrieves data, and arranges it for presentation in a useful format. That's exactly what you want a computerized data-base manager to do for you. The great thing about doing it with a computer, though, is that it all happens so much faster and more accurately. The problem, however, is that computers just don't do things in the same manner in which a person would.

Here's where we have to get back to terms for a little bit. We compared the set of files in the personnel department with a data base. That's a fair comparison, in that the personnel data base contains all the information the department needs to get its job done. But it's an unfair comparison because of the way the data's organized. Paper files are often arranged with dissimilar records placed in the same file. If it's a personnel file, a person's folder can contain several different kinds of forms—everything from salary adjustments to letters of commendation.

Computers require a much more orderly structure than that. If you want a file to contain information about a person, then all the records (forms) in that file have to be of the same design. That kind of record structure is called a hierarchical structure. It doesn't make any difference to the computer if all the fields (the spaces on the form) are filled in, but it does make a difference if you try to put in information that the form's design forbids.

So, using a computer to store your information requires a lot more foresight than does a paper filing system. It's as if you told your personnel clerk that he had to keep all the information he does now, but that he can only have one form to fill in. He has to get all the information on that one form and if, in the future, he finds he's forgotten something, then he'll have to redesign the form, the company will get it reprinted, and he'll have to fill in the data all over again.

The prospect sounds pretty drastic, but you can take comfort in the knowledge that data-base management software makes the process a lot easier than it would be if you were using a manual system. Redesigning a form isn't the month-consuming

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How do you know which data-base manager is best for you?

task it is with a paper form, and rekeying data—if it comes to that—isn't as tough with a computer as it is with a typewriter.

But these things do take time, and that's why some people boost relational data-base management systems as the way to go. With a relational system, you don't have to redesign the forms you're using every time your boss decides he wants a different set of information from your system. You simply design another form, and then relate the file containing the first form with the one containing the second. Both files may be hierarchical in nature, but a relational data-base manager has the capability to link one form with the other. If that sounds confusing, it isn't.

Suppose the personnel department in our example had designed a form to input information about a new employee's previous employment. The data are input to fill up the records in the file, and when the job is done the company president decides he wants a report listing each employee's prior history and his current supervisor's evaluation. The supervisor's evaluation isn't on the history form. No sweat. You just define another file for evaluation, and key in that data, along with a data item that will be common to both files—the employee's name, probably. Then when it comes time to get out the report, you tell the data base manager to open both those files, extract the information you need from each, and print it according to a report format you've specified.

"A relational scheme," says David Cole, president of Ashton Tate in Culver City, Calif., publishers of dBASE II, "is forgiving. It's tolerant, friendly, and resilient." The ability to forgive comes about in a relational system's ability to let you be creative in the way you structure your data input and output.

If, for example, you now keep a form which contains 25 spaces for a person's name and 30 spaces for his address, and you decide that you want to use a computer to maintain that information in exactly the same way as you do on your paper records, then you need a data-base manager that will allow you that maximum number of characters per field. Similarly, if you need to keep 100 fields in a person's master employment history form, then you'll need a data-base manager that allows 100 fields per form.

"Look at the output you need," advises Frank Colon, product development manager for Stoneware in San Rafael, Calif., publisher of DB Master. "The output is where you start, and that will determine the form you'll need to input the data."

But how do you know what output you're going to need? Sometimes you just don't know. Our example of the personnel department shows that you're not going to be able to determine everything that's needed, because you don't know what the conditions in your activity will be a month from now, let alone next year . And, as we've said, this is where the relational data-base manager can have great value, because as different needs arise, you can simply go in and tailor the output into a form that will suit those needs. The relational data base will organize the data from multiple forms into one report.

Most of the data-base management products available for personal computers contain elements of both kinds of systems—relational and hierarchical. They're hierarchical in that a file contains forms of a specific design, and all the forms contain similar information. If you want employee-history information, you go to the employee-history file. They're relational in that they allow you to select specific information from one or sometimes more files for output, and to do it in different ways. You could, for example, structure ad hoc inquiries. (How many of my employees are left-handed and part their hair on the right side?) The terms, again, are somewhat inconsequential. What's important is what you can do with a system.

More discriminators

"The key," says John Richardson, who developed Power-Base, a database management system from New York-based GMS Systems, "is what you need, and how technically oriented you are. Some programs have a lot of capability but require programming to access that capability. Others have a strong user interface, but don't allow the use of multiple files, for instance, so you'll quickly outgrow them." So ease of use and breadth of capability are important issues in selecting a data-base manager.

Similar advice comes from Lechter. "The most important issue," he says, "is whether you can use it. Then, will it do the job. Finally, what features does it have as compared to others that you can use."

If you can't use a program, then it clearly doesn't make much sense to buy it. Many data-base management programs classed as relational systems could fall into this category. Although these programs offer numerous capabilities, they do have their price—the more flexible the program, the more difficult it is to use. If you only want to use a few of the program's capabilities you could do so with little trouble, but if you want to take full advantage of all the program has to offer, don't expect it to be a breeze.

DBASE II is the example that many point to as a program that's tough to use. It's also the program that has a lot of attendant programs available from third-party developers. "We've done everything we can to encourage third-party suppliers," says Cole. "We're moving from the sophisticated user to novice or even hostile users. So we're shifting the balance of power from those who know how computers work

Personal-computer users care about getting data into the computer and manipulating it so they can use it.

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SOFTWARE SOLUTIONS, INC.
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(203) 877-9268

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50 Belvedere St.
San Rafael, CA 94901
(415) 454-6500

VISICORP
2895 Zanker Rd.
San Jose, CA 95134
(408) 946-9000

to those who know the applications and only incidentally know the computer."

People criticize dBASE II simply because it is really more than a data-base management system—it contains what Cole calls "a coupled high-level language." To get the most from this program you have to program it. Through the programming you design input forms, file structures, and output forms. Many people don't want to program, thinking it's too hard, or would take too much time, or they just don't care to learn how to do it. That's why Ashton Tate has encouraged the third-party development, and why a fairly large industry has sprung up around this one software product. That industry provides everything from report templates and instructional programs to turnkey systems for dBASE, which look like a complete application program to the user, who might never know that a data-base manager started the whole thing.

So the ability and/or necessity to program in a data-base manager isn't a de facto reason to use it or not. The programming capability adds flexibility that can't be provided in a program that has a more structured interface, and flexibility may be what you need a data-base manager for. Some hierarchical data-base managers are popularly called filers, and are the antithesis of the large, programmable, relational data-bases like dBASE II and MetaFile. These hierarchical products are normally menu driven and easy to use.

"Our customer has a filing problem," says Software Publishing's Gibbons. "Most guys make data bases," he continues, "and they're for programmers. But most people want to just write down what they want. If they're going to write it down anyway, why not put it into a computer?"

Filing products are correctly described as being aimed at the person-

(See buyer's guide page 125)
(continued on page 206)

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CIRCLE 218

PE 2/84

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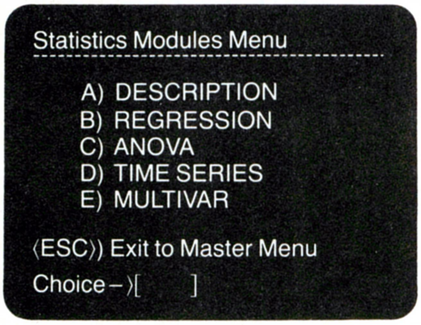


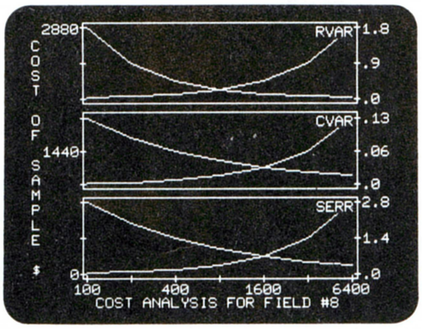
Statistics Modules Menu

A) DESCRIPTION
B) REGRESSION
C) ANOVA
D) TIME SERIES
E) MULTIVAR

⟨ESC⟩) Exit to Master Menu

Choice –⟩[ ]

Transformations and over 400 conversions are available. You can place the results of these transformations into the same field or any other field in STATPRO's database.



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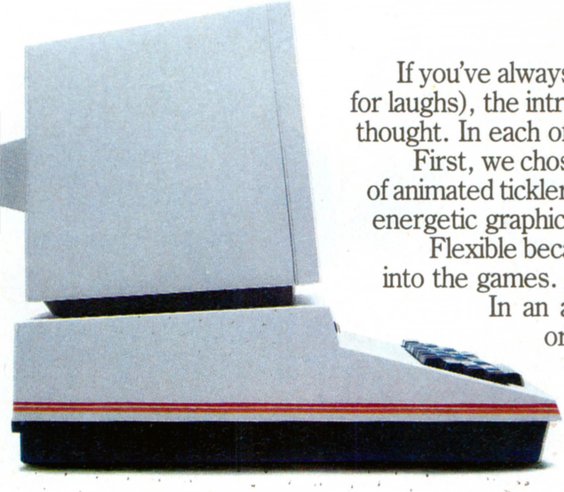
CIRCLE 120

(story continued on page 206)

BUYER'S GUIDE TO DATA· BASE MANAGEMENT

COMPANY/PRODUCT	SYSTEMS	PRICE	RECORDS PER FILE	FIELDS PER RECORD	CHARACTERS PER FIELD	OPEN FILES	USER INTERFACE
ALPHA SOFTWARE Data Base Manager II	IBM PC, XT; CPQ	$295.00 R	Limited by disk space	40	60	1	Menu Driven
APPLE COMPUTER QuickFile IIe, III	APL IIe, III	$100.00 R	250	15	76	1	Menu Driven
AppleFile III	APL III (with 256K and a hard disk)	$325.00 R	30,000	80	255	1	Menu Driven
LisaList	APL III	$195.00 R	Limited by memory	100	128	1	Menu Driven
APPLIED SOFTWARE TECHNOLOGY VersaForm	IBM PC and compatibles; APL II, IIe, III	$389.00 R/M	900 (diskette) 28,000 (hard disk)	75 (APL III, IBM PC) 50 (APL II, IIe)	78	1	Menu Driven
ASHTON-TATE Friday	ALT; EPS; EAG; IBM PC; KAY; OSB; TVD; TI; XER; VIC 9000	$295.00 R	65,000	32	32	1	Menu Driven
BUSINESS SOLUTIONS Jack 2	IBM PC and compatibles	$495.00 R	50,000	1000	1500 (per record)	1	Word Processor
CONCENTRIC Concentric Information Processor	IBM PC and compatibles	$395.00 R	65,000	Up to 40	50	1	Menu Driven
CONDOR Condor I	IBM PC ; CP/M; MS-DOS; PC-DOS	$295.00 R/M	65,534	127	127	1	Command Driven
CONTEXT MBA	IBM PC, XT; HP 150, 200; DEC; VIC 9000; EAG; 1600, NEC	$695.00 R	16,000	95	Up to 8000	1	Menu Driven
COSMOS Revelation	IBM PC and compatibles	$950.00 R/M	Limited by disk space	65,000	Up to 65,000	6,000	Menu or Command Driven
EMERGING TECHNOLOGY Offix	IBM PC, XT; VIC 9000; TI	$99.00 R	100	50	250	2	Menu Driven
EXECUTEC Series One Plus	IBM PC and compatibles, XT; DEC; W; VIC 9000	$495.000 R	Limited by disk space	35	80	16	Menu or Command Driven
GMS SYSTEMS Powerbase	IBM PC, XT	$395.00 R	65,000	64	80	16	Menu Driven
INNOVATIVE SOFTWARE Fast Facts	IBM PC	$195.00 R	15,000	Unlimited	255	1	Menu Driven
Tim III, IV	IBM PC	$495.00 R/M	32,767	40	2400	1/2	Menu Driven
KEY SOFTWARE ResQ	IBM PC, XT with 128K double-sided drive)	$395.00 R	32,767	60	80	2	Menu Driven
LOTUS DEVELOPMENT CORP. 1-2-3	IBM PC and compatibles; VIC 9000; ZEN Z-100; DEC; HYP; W	$495.00 R	2047	256	240	1	Menu Driven
MICRO DATA BASE SYSTEMS Knowledge Man	IBM PC; MS-DOS; PC-DOS CP/M-86	$500.00 R/M	65,535	255	Up to 65,535	Limited by memory	Command Driven
MICROPRO INT'L. InfoStar	IBM PC; APL II, II+, IIe, III; DEC; TVD; NS	$495.00 R/M	65,535	255	120	255	Menu Driven
MICRORIM R: Base Series 4000	IBM PC and compatibles	$495.00 R	400	400 per data base)	1,530	40	Menu Driven
MICROSTUF Infoscope	IBM PC and compatibles	$225.00 R	Limited by memory	Limited by memory	Limited by memory	Up to 16	Menu Driven
O'HANLON The Sensible Solution	IBM PC and compatibles	$695.00 R	16,000,000	384	255	10	Menu Driven
OVATION Ovation	IBM PC and compatibles	$795.00 R	Limited by disk space	Variable	256	4	Command Driven
PC SOFTWARE Creatabase	IBM PC, XT	$75.00 R/M	Limited by disk space	16	80	1	Menu Driven
SMALL COMPUTER CO. Profile Data Base Manager	TRS 16	$500.00 R	Up to 6,000,000	999	99	4-7	Menu Driven
Profile III+	TRS III, 4	$200.00	64,000	99	99	1	Menu Driven
READER'S DIGEST Listmaker	TRS I, III, 4; APL II, II+, IIe	$97.50 R/M	Limited by memory	12	30	1	Menu Driven
SOFTREND Aura	IBM PC and compatibles	$495.00 R	Limited by memory	256	255	1	Menu Driven
SOFTWARE PRODUCTS Open Access	IBM PC and compatibles	$595.00 R	32,000	55	40	5	Menu and Window Driven
SOFTWARE PUBLISHING PFS: File	IBM PC and compatibles, XT; APL II, IIe, III	$140.00 (IBM) $125.00 — $175.00 (APL) R	22,000 (IBM) 1000 (APL)	100	1679	1	Menu Driven
SOFTWARE SOLUTIONS DataEase	IBM PC, XT; VIC 9000; DEC; TI; W	$595.00 R	65,535	255	255	Unlimited	Menu Driven
STONEWARE DB Master	APL II, II+, IIe; IBM and compatibles	$350.00 (APL) $595.00 (IBM) R	250,000 (APL) 1,000,000 (IBM)	100 (APL) 250 (IBM)	100 (APL) 220 (IBM)	1	Menu Driven
VISICORP VisiFile	APL II+, IIe; IBM PC, XT	$250.00 (APL) $300.00 (IBM) R	Limited by disk space	24 (APL) 104 (IBM)	128 (APL) 104 (IBM)	1	Menu Driven
Visidex	APL II, II+	$250.00 R	Limited by disk space	Limited by screen size	880	1	Menu Driven

READER'S DIGEST INTRODUCES SOFTWARE GOOD ENOUGH TO GO OUT AND BUY A COMPUTER FOR.



If you've always thought of a computer as an expensive toy (or if the one you own now is used for laughs), the introduction of Reader's Digest Software™ games will give you pause for a lot more thought. In each of our programs we have done something quite unique.

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READER'S DIGEST

CIRCLE 17

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The Wide World of Alternative Input Devices

The mouse, the touch tablet, the light pen, and voice command are breaking down communications barriers between people and computers

by Craig Zarley, Associate Editor

If you're frustrated with having a hunt-and-peck association with your computer, don't get discouraged. A recent survey of corporate managers revealed that most favor an alternative to keyboard input on personal computers. Why? For the simple reason that most of them, like many of you, can't type.

The survey reflects that many managers are reluctant to use personal computers, an issue which is the basis for a new trend in the personal computer business—one which both software and hardware manufacturers are jumping on in an effort to go after the corporate executive who shies away from interacting with computers. How are they doing it? By simply offering a viable alternative to keyboard input.

When personal computers were first designed, manufacturers essentially married the typewriter with the new technology. The typewriter was a widely used and efficient tool, so if you could type, you could figure out how to use the computer in a relatively short time. The keyboard was friendly, familiar, and eased the transition into the world of computing. Data entry, cursor control, printing commands, virtually anything you

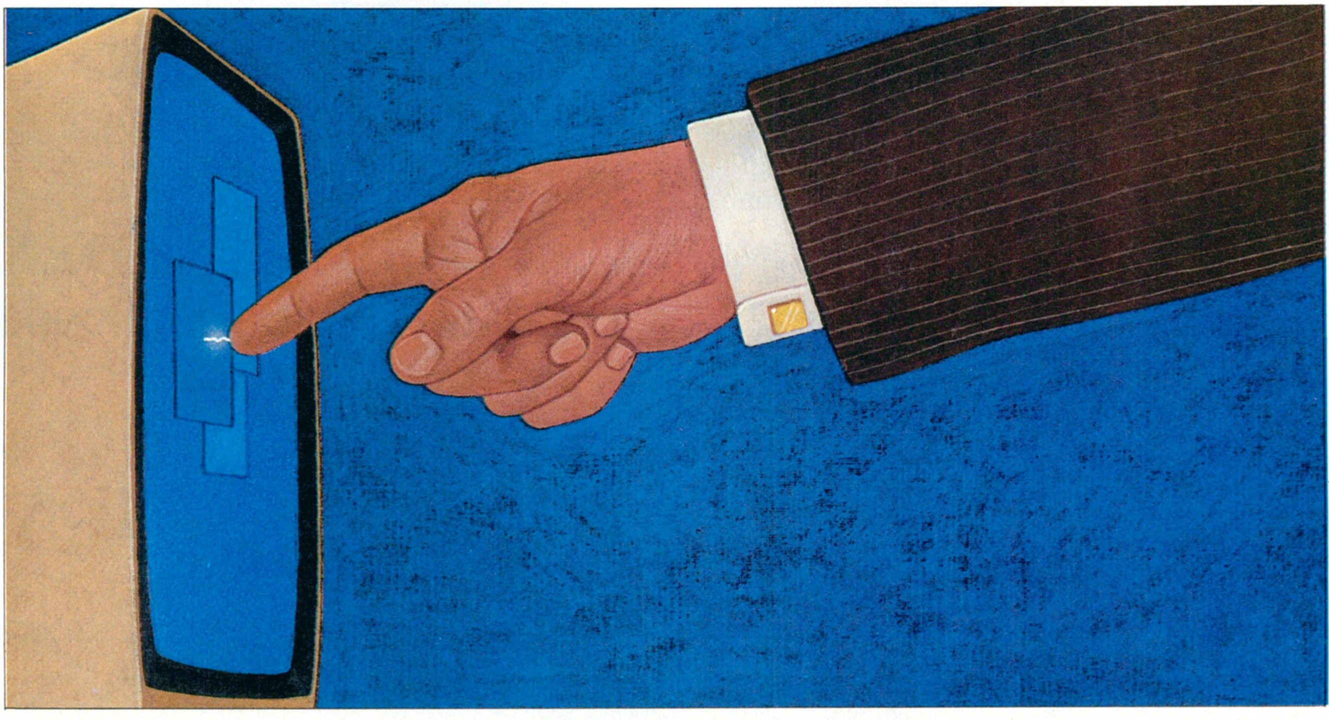

Illustration by Keith Batcheller/American Artists

If you thought the keyboard was the only way to communicate with your computer, think again. Alternative inputs are ' ere to stay, and they're going to bring new power and flexibility to the work you do.

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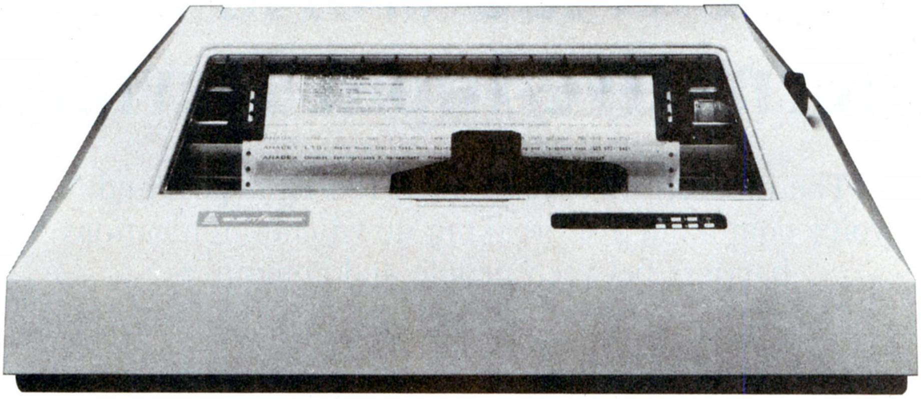

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But with all that's new, some things haven't changed. The Anadex commitment to service and support. For example, any Anadex customer can call our toll-free numbers and get technical help. For as long as he owns the printer.

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CIRCLE 194

With the new input devices, you don't have to be an ace typist to use a computer.

needed to do on the computer could be easily accomplished by simply "typing" instructions into the system.

But a whole new class of user has emerged in recent years. As the survey points out, many executives and other decision-makers simply aren't typists. And if you aren't familiar with the keyboard, learning how to use computers may seem an overwhelming task. You face the proposition of first finding the location of each key on the board, then learning how to use the computer. As business managers, many of you don't have the time to waste. What you have done is delegate the office computing to others. But as a decision-maker, you are the person who most needs the power of a personal computer.

Now the industry has taken notice of this gap in the market, and instead of requiring you to type commands into the computer, it is making the power of its machines more easily available by giving you the options to enter your instructions and manipulate information with a mouse, your finger, or even your voice. Light pens, bar code scanners, sketch pads and a host of other alternate inputs have long been around to accomplish specific tasks such as drafting, freehand graphics, or inventory control, but the new alternate inputs are designed for general business applications. Instead of typing a whole series of instructions to manipulate data, you can now point with your finger or a mouse. Spreadsheets, graphics, word processing—you can now have a hand in these common business applications, with little if any keyboard input. Not only is using the computer easier than before, but you can now perform feats previously not possible with a keyboard.

The primary difference between standard keyboards and these new input devices is ease of moving about the screen and getting in and out of files. If you were using a word-processing program with a keyboard, for example, you could use the cursor to designate a block of text for editing. This is accomplished through either a series of commands or by moving the cursor line by line through the paragraph or page. While a definite improvement over the typewriter, this method still requires a degree of familiarity with the keyboard as well as memorization of the appropriate commands for deleting, moving or adding text. With alternative devices like the mouse, the cursor becomes an extension of your hand or brain, which is activated by moving the mouse around on the desk top. Once you get used to aiming the cursor with the mouse, it's a cinch to move from the uppermost to the bottommost corners of the screen. If you want to delete a paragraph, you don't have to memorize a series of commands. Simply move the cursor to the beginning of the text and press the button on the mouse. Then, by moving the mouse across the paragraph or page, the entire text is blocked for editing. Another click of the button and it disappears. It's a lot like comparing a sophisticated video game to Pac-Man; one gives you freedom to move randomly about the screen, while the other forces you to keep within a predetermined route.

Photo courtesy of Apple Computer, Inc.

Lisa's mouse has led the way in the development of alternative input devices for personal computers.

"I have been waiting for years for a machine that had something like the mouse," says Ed Hoedemaker, assistant project director for budget and reporting at the National Center for Advanced Materials, a $150 million Department of Energy project coordinated through the Lawrence Berkeley Laboratory at the University of California, Berkeley. Hoedemaker recently purchased three Apple Lisa computers to manage the project, which calls for the construction of a photon accelerator to study the property of various materials.

"I don't like keyboards and I'm not a typist," he explains. "When you aren't a typist, you are confronted with a random set of keys, whereas with the mouse, you have a pointer and an icon and it's very straightforward. You can see what you need to know on the screen."

But Hoedemaker didn't purchase the Lisas simply because they offered the mouse as an alternative to keyboard input. The breakthrough with Lisa is that it is a complete office system with software designed to take full advantage of the mouse as an input device.

"I like the mouse, but basically I bought the Lisa because it looked like it had tremendous power for a personal computer," he explains. "My function is budget and administration, but I can write memos and use it as a terminal emulator to hook into the university's main computer."

Hoedemaker uses LisaCalc for spreadsheet applications and LisaList to keep track of people, salaries, pay raises, and phone numbers for the myriad of workers involved in the project. With the mouse as an input device and integrated software that incorporates the same basic set of commands, he can call up more than one Lisa application on the screen and manipulate the data simultaneously.

"You can write a memo and design a pie chart, and display them at the same time," says Hoedemaker.

RUN "TAXES"

I/O ERROR
Disk Media Error

A Modern Day Fable.

Once upon a time there was a very diligent man, Jack. Every year the man promised his very faithful wife that he would keep accurate records to make tax time more bearable.

One sunny day, Jack traded in his family cow for a new computer. That starry night, he began to enter all of his tax records onto disk. "How easy and accurate this will be," he stated.

The months went by. Tax time approached. Confidently, Jack inserted his data file and entered "Run Taxes." "Just watch," he said to his wife. But alas. His CRT, as if it were alive, proclaimed, "I/O ERROR." "Gads," he stammered in frustration. "Oh my," said his wife.

Then entered his neighbor carrying three beans, a golden lyre and the new Discwasher® Clean Runner™ Interactive Drive Cleaner. The good neighbor told Jack, "Preventive maintenance will destroy dirt in the disk drive and keep it running clean."

The good neighbor promptly inserted the Clean Runner Interactive Drive Cleaner into the drive and cleaned the read/write heads for Jack. Saying "Bye," he left to tend to his garden. Diligent Jack then proceeded to run his tax data and this time all went well.

The moral of the story, Discwasher Clean Runner is a disk of prevention for a bit of frustration.

The End.

Not all endings are that happy. A dirty read/write head can cost not only many hours of time but also the loss of valuable data.

- *Discwasher® Clean Runner™ Interactive Drive Cleaner is one disk that contains both the program software and the cleaning surface. There is no program to enter.*
- *Clean Runner is an interactive system. It responds to your individual entries as it leads you step-by-step through the cleaning process.*
- *Clean Runner directs the head(s) of your drive to a different track for each cleaning. Clean Runner provides a contamination-free cleaning surface.*
- *Clean Runner effectively works on both single or double-sided drives.*
- *Clean Runner is programmed for 20 cleaning operations.*

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A Disk Of Prevention For A Bit Of Frustration

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CIRCLE 164

"I'm not a typist. I've been waiting for years for something like the mouse."

"Then with the mouse, you can change the size and shape of the different graphs and move them around on the screen. It's like a magic wand; I can't imagine how you could move a graph around on the screen using a keyboard."

Pushing the industry

While Lisa was the first product from Apple to incorporate the mouse, it won't be the last. A mouse will soon be available on the Apple IIe, and one will certainly be incorporated in future Apple products. The reasons for this are simple.

"We wanted to make the computer less intimidating so that someone who might otherwise not buy one would now see owning one as an option," says Doug Pollack, Apple's hardware product marketing manager for Lisa. "With the mouse, people could see that computers were not only easy to learn but easier to use. And the mouse makes the machine more powerful for the experienced user."

The development of the mouse as an input device involved a bit more ergonomical study than did the marriage of the computer and the typewriter. Apple realized that once it decided to integrate a graphics interface into the system, it bought into some form of electronic pointing device. "The mouse is the best input device for a variety of reasons," explains Pollack. "It's great for pointing at and selecting a task, and for moving objects around the screen. It's only drawback is that it isn't ideally suited for free-hand drawing. But the mouse is nice because it will work on any surface, and you don't need a special graphics tablet."

Pollack says the advantage of using a mouse over a light pen or touching the screen with your finger is that "you can use the mouse easily and intuitively, like an extension of your body." He feels the user would get tired if he had to keep touching the screen with a light pen or his finger. But aside from ease of use, Pollack believes there are things you can do with the mouse that you couldn't do with a keyboard or any other input device.

"You can use the mouse to select from a palette of different shapes," he says. "Then by pointing toward the area of the sketch pad, you can draw objects, resize them, and move them around the screen. When you're editing a manuscript, you point at the beginning of a block of copy, hold down the button, drag the mouse across the screen, and it will pick up all the words in between. Then you go to the menu bar and select Cut or Paste. You can even vary the type style of the words."

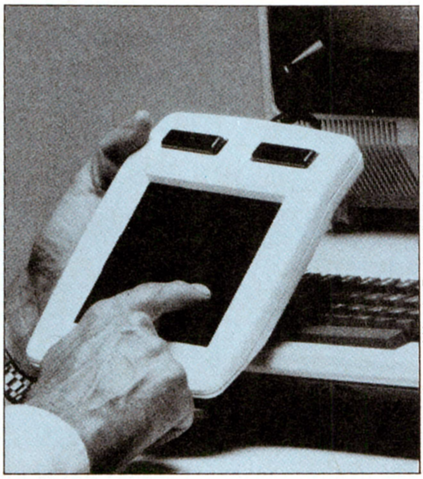

Photo courtesy of Koala Technologies Co.

The Koala Pad from Koala Technologies Corp. lets users take advantage of high-resolution graphics features.

But as Pollack points out, the industry needs to take a new approach with software design to use alternate inputs effectively. In order to get as much mileage out of a computer as Apple has out of Lisa, the software must be designed to work with a specific input device. "Our market requires computers that are easier to use," he says. "We are trying to push the industry in that direction and set a standard for alternate input devices along the way."

Alternatives to keyboard input are in great demand, but until Lisa came on the scene, it was tough to find software integrated with an input device that would access a wide range of general business applications. Light pens, graphics pads, and other hardware devices are great for specific applications, but most of them are not supported by software that addresses those features.

"When Lisa broke, many analysts predicted that by 1990, 40 to 60 percent of the personal computers in the market could use a mouse-type device," says Bernard Ciongoli, president of Ampower Instrument Co., Inc., a light-pen manufacturer located in Fairfield, New Jersey. "But there's been a gap in the software available to drive these devices. Basically, it's been a problem of standardization—which device do you write the software for?"

An Ampower subsidiary, Photobell Company, Inc., does offer a light pen that is a direct replacement for Lisa's mouse. Called the Track Pen TP-50, the device plugs into the same connector port allocated for the mouse and drives all of Lisa's application software. "The mouse is like a pack of cigarettes rolling around on a table top," says Ciongoli. "The Track Pen can accomplish the same things as the mouse, but it's easier and more natural to use."

Instead of pointing at the screen or pushing a button, the Track Pen is used on a desk top like a regular pen. You simply trace the motion on the desk top to point to or move objects on the screen; the movement of the pen on the desk corresponds to a like movement on the screen. Commands are activated by applying pressure to the tip of the pen rather than pushing the button on the mouse. And if Apple introduces a mouse on the Apple IIe, Ampower is ready to piggyback onto the applications software with the Track Pen. (The Track Pen plugs into an RS-232 serial card on the IIe.)

Despite their ease of use and added capabilities, most alternate input de-

With the mouse, the cursor is an extension of your hand and brain.

vices coming into the market aren't designed to *replace* the keyboard—if you want to write a letter, for example, a light pen, mouse, or other pointing device is useless until you begin editing—but rather to take advantage of sophisticated new features on personal computers such as high-resolution graphics and color printers. If you want to use the new application software which requires you to input instructions by pointing at an icon (a picture that represents a function, such as a drawing of a wastebasket to represent the delete function), four-directional keyboard cursor movement is not the best way to do it. It should be fairly obvious by now that at some point in the future, you're going to need alternate inputs. Not simply because they're easier to use, but because they enhance the capabilities of your system.

"Lisa is a view of the future because it offers integrated software written for a specific pointing device," says Mark Duchesne, vice-president of marketing at Koala Technologies Corporation in Santa Clara, California. The company sells a KoalaPad Touch Tablet for the Apple II series, the Commodore 64, the VIC 20, the IBM Personal Computer, and Atari Home Computers. The KoalaPad has two buttons like a mouse, but also features a 4¼″ square screen that functions as both a graphics pad and a touch input device.

"The KoalaPad is an excellent pointing device, gives you good graphic input, and lets you insert screen overlays that essentially give you a custom keyboard tailored to your specific application," says Duchesne.

Essentially, what the pad does is give you a miniature screen with a menu of various commands. Instead of typing a series of instructions into the computer, you merely use your finger to touch the pad. Again, however, the problem is a lack of software which works with the pad and is tailored to the general purpose business market. Most of the applications software that comes with the KoalaPad is aimed just at the educational and entertainment markets. Micro Illustrator, for example, lets you design and save your own graphics using the touch tablet, but it doesn't interface with data-base software necessary for you to generate business reports. But all of this will soon change.

Duchesne says Koala has programs under development that will enable you to perform cursor-like movements with the KoalaPad when you're using Lotus 1-2-3, VisiCalc, WordStar, dBASE II, and many other popular business packages. Instead of typing instructions, you will be able to touch the pad and execute a whole series of commands.

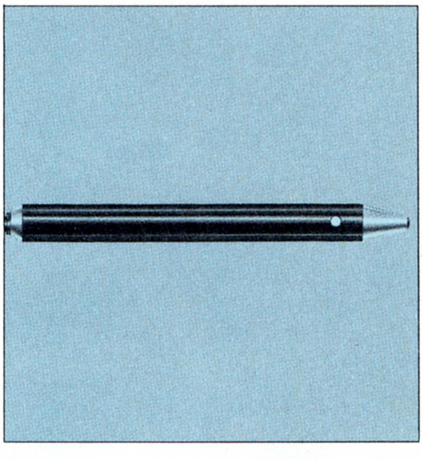
Photo courtesy of Tech Sketch, Inc.

The light pen takes commands traced by the user on a desk top and transfers them to the personal computer.

"But these programs were not designed the way Lisa was designed," he explains. "Where WordStar, for example, may be 25 to 50 percent better using the KoalaPad, WordStar totally redesigned to take full advantage of a specific input device might be 150 percent better."

Duchesne sees a time when several standard input devices will emerge with third-party software companies writing programs to take full advantage of the hardware. "There are no standards today, and there will probably be a software gap for the next several years. But even as software becomes integrated with specific input devices, those users who already own software won't be totally left out because many of the programs we are developing will interface the KoalaPad with existing packages."

Offering a different alternative input option, Srinivas Sukumar, Hewlett-Packard's research and development section manager in the personal office computer division, says that "The touch screen is the most natural way to go."

Hewlett-Packard recently introduced the HP 150 personal computer, which incorporates a touch screen with which you use your finger as the device to access data and issue commands. Among the packages redesigned to take advantage of the touch screen are WordStar, VisiCalc, Data Base Manager, Lotus 1-2-3, Microplan, and dBASE II.

The 150 marks HP's entry into the mainstream personal business computer market. The corporate executive is the machine's target; the touch screen alternate input device is the hook.

"People are familiar with touching," says Sukumar, adding that Hewlett-Packard is "aiming at that class of user who is afraid of the computer." In his opinion, "Most executives manipulate and graph data as opposed to entering it. The keyboard may not be that familiar to them."

Touching the screen has benefits similar to other alternate input devices. Instead of having to memorize function keys and sequential commands, you merely touch the appropriate screen item to initiate a series of instructions. If you want to edit a block of words in a letter or report, you mark the beginning and end with your finger and point to the appropriate menu item such as Delete or Insert. When you want to change the size or shading pattern of a graph,

(continued on page 137)

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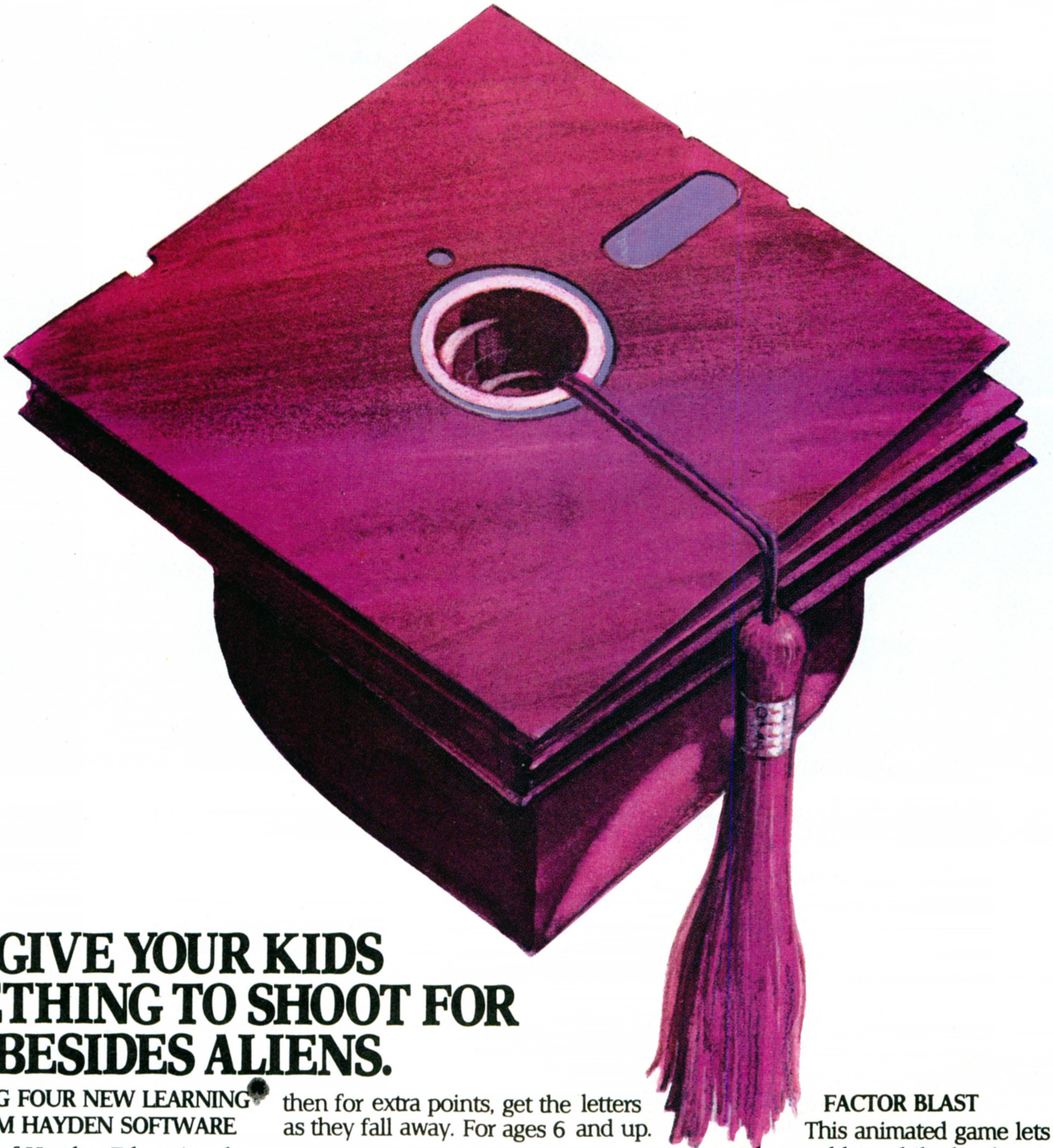

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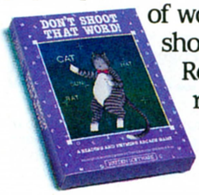
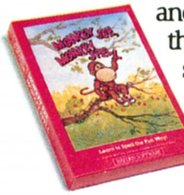
In this reading game, a picture pops up on the screen and a series of words move across a shooting gallery. Reading skills are required to determine which words match the object. The goal is to shoot all the wrong words, then for extra points, get the letters as they fall away. For ages 6 and up.



MONKEY SEE, MONKEY SPELL

Kids learn to spell by racing a monkey up and down a "letter" tree and grabbing those letters that spell the object shown at the bottom of the screen. Monkey See, Monkey Spell features six difficulty levels and a memory game. For ages 4 and up.



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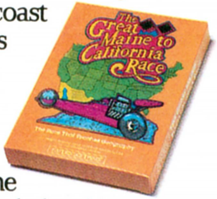
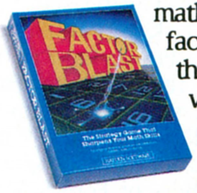
A great way to learn about the geography of the U.S. Two dragsters race from coast to coast answering questions about state capitals, sizes, boundaries, products and other interesting facts. The race is not to the swift but to the knowledgeable. For one or two players, ages 10 and up.



FACTOR BLAST

This animated game lets kids have a blast while developing their math skills. It teaches the factoring of numbers through 100, which is vital for understanding both fractions and algebra. Factor Blast provides three levels of difficulty and the option of playing against the computer.



For ages 10 and up.

For more information, see your local retailer, or call 1-800-343-1218 (In MA 617-937-0200). Hayden Software Company, 600 Suffolk Street, Lowell, MA 01853.

Hayden Learning Games

HAYDEN SOFTWARE

Runs on Apple II, II +, IIe, Atari and Commodore 64 Computers.

CIRCLE 95

"Speech is the ultimate input. You can tell your computer what you want."

(continued from page 134)

you just touch the screen and it's done automatically.

As with other alternative inputs, software designers must write programs for a specific alternate input device to reap their full benefit. (Sukumar figures it takes up to six months of manpower to redesign a piece of existing software to run on the touch screen.) One project HP has underway will put a full-function calculator, capable of being activated by touch input, onto the screen.

As Sukumar notes, "Until one alternate input device sets an industry standard, there's going to be a gap in software written with a specific device in mind. Until then, it falls on the shoulders of the hardware manufacturers to write their own software and get the whole thing started."

The ultimate input

While you're waiting for software integrated with standard alternate input devices, you can go ahead and redesign existing programs to enter data by using your own voice. Texas Instruments has just introduced Speech Command for its Professional Computer. This product lets you integrate voice commands with any existing MS-DOS applications package that runs on the computer.

The Speech Command package consists of two piggyback circuit boards that plug into a single slot in the computer. Voice input is through a microphone headset. What you do is build your own vocabulary dictionary and save it on disk. Then when you issue a verbal command such as, "Give me quarterly sales figures," Speech Command automatically executes a whole series of instructions. Instead of typing 20 or 30 keystrokes to get the information you want, you can use Speech Command to get the data for you.

You can construct phrases of up to 50 words long—the number of commands and phrases you store on your system is limited only by the amount of memory. A standard 320k disk, for example, stores about 16 minutes of speech. A 10k hard disk can record up to eight hours of voice input.

The price for retrofitting your existing computer software to accept voice commands does not come cheap. The complete Speech Command kit retails for $2600.

"Speech is the ultimate input," says Ann Langlinais, TI's product manager for Speech Command. "You can tell your computer what you want, and it gives it to you, whether in hard copy or via the screen."

Photo courtesy of Texas Instruments, Inc.

Voice command lets you communicate directly with the computer, bypassing standard keyboard input.

TI conducted research that charted the daily activity of mid- and upper-level corporate managers. The study showed that a significant portion of an executive's time is spent in verbal communication. And TI believes speech input is the way to attract this new class of user.

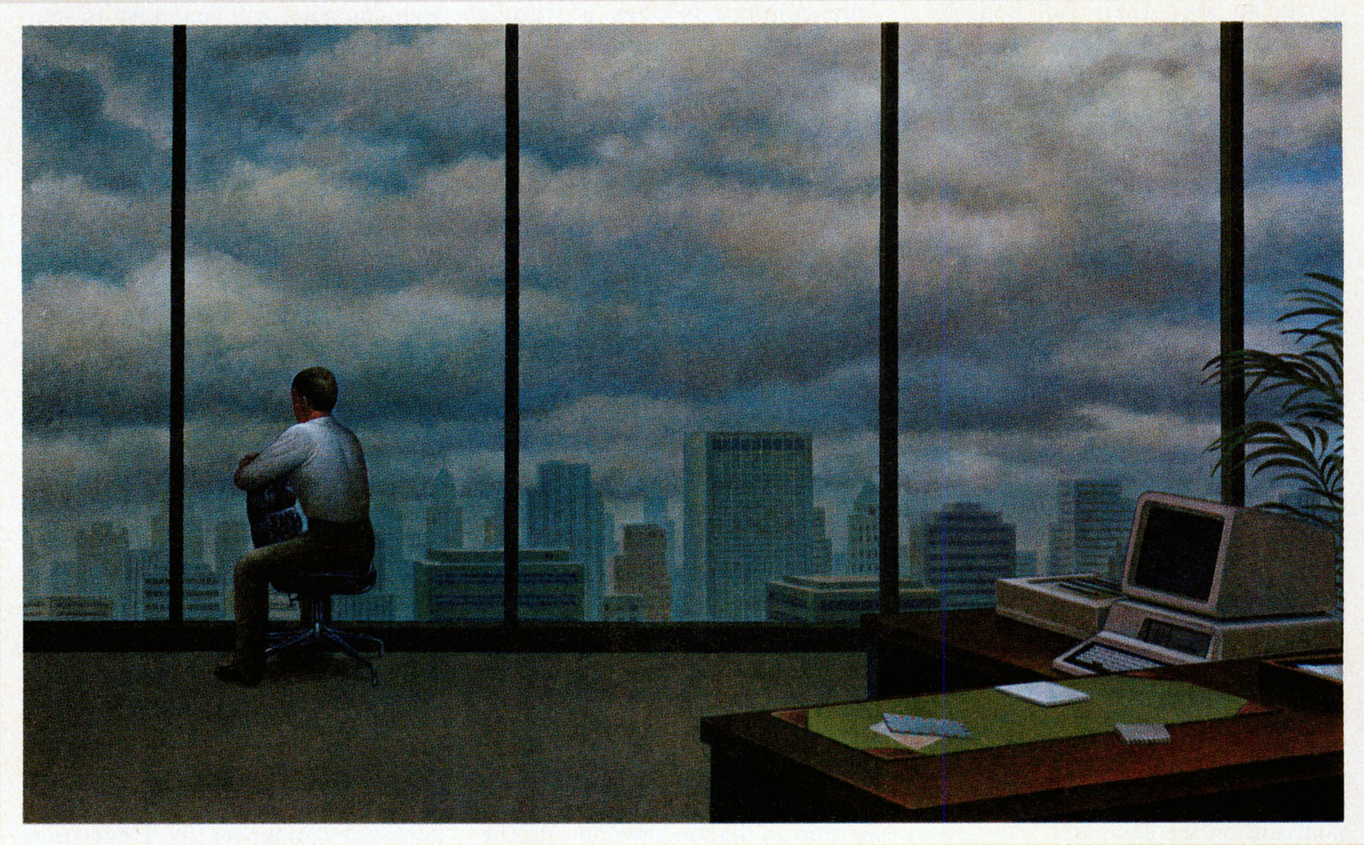
"The Speech Command product eliminates much of the keyboard input and should bring more managers into personal computing," Langlinais says. "When a manager wants a monthly sales forecast or a quarterly report, he has to stop and think what keys he has to hit. And it's hard to remember the different sets of function keys when you're moving from one package to another. With Speech Command, you just ask for what you want and you get it."

As third-party software vendors start incorporating speech into their products, Langlinais says that soon your computer will be talking to you, too. Help screens, for example, could be verbal. Instead of seeing an error message and calling up a Help screen the computer will tell you what to do.

"You would just hit the Help key and the computer would tell you how to correct the problem while you're looking at it, instead of jumping back and forth between screens," says Langlinais.

Voice Driver, a voice recognition module board, is also available for the Apple II series from Voice Recognition Systems of San Francisco, California. Voice Driver consists of a voice input module board, software, microphone, and a headset that allows you to teach the input device an 80-word vocabulary. Voice Driver can learn a new vocabulary anytime you want to change the original. The board sells for $995 on the Apple II or II Plus and $1070 on the Apple IIe. A version is also available for the IBM Personal Computer that sells for $1470. A speech recognition device is also being offered for the Personal Computer by Heuristics (Sunnyvale, Calif.) at a retail price of $3000. The product has a capacity for 64 words or phrases of up to three seconds each, is expandable to 128 words, and offers 99 percent speech recognition.

The message is clear—there's a whole new generation of computer products that makes personal computing accessible to everyone. The demand for a better and easier way to compute has been heard, and now it's here. Keyboard intimidation should no longer keep anyone from using a computer. From now on, when you go to buy a computer and ask, "What's the best and easiest way to enter data?" The answer is likely to be: "Whatever's your pleasure."



It promised to take the work out of work.

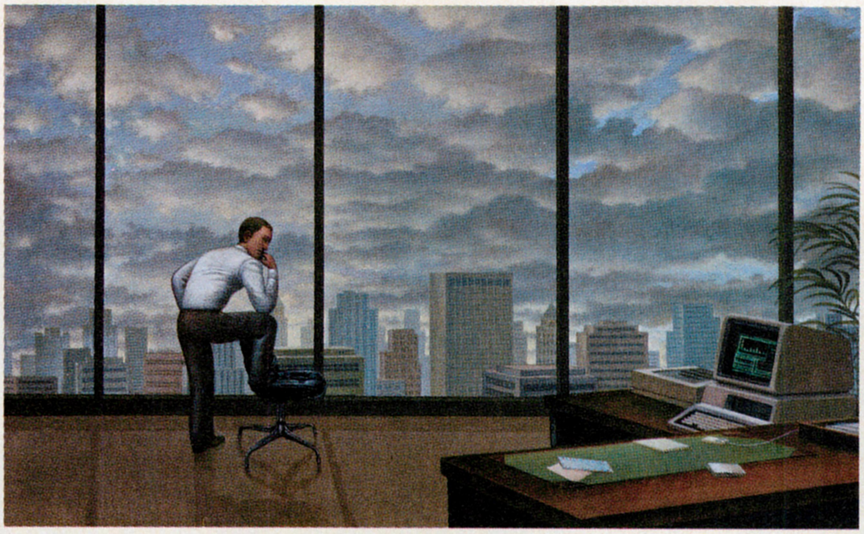
The personal computer courted you with endless promises. It would do your job faster, make life easier, send you home happier. It would do the heavy lifting, you would do the heavy thinking.

Alas, reality fell short of the dream.

The computer refused to do things the way you like to do them. Refused to juggle lots of jobs at once. Refused to move swiftly from project to project. Refused, even, to understand simple English.

And then. Each software program took days, weeks (sometimes classes) to learn. There was no way for individual programs to talk to each other. No way to take data from here and transfer it to there.

The machine that promised to be your partner in a new era of productivity has behaved like a renegade two year old.



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Think of Visi On as a "boss" who instructs the computer on how to deal with the specific applications you want to work with: Visi On Calc,™ Visi On Word,™ Visi On Graph,™ and Visi On Query.™ Since all these applications work for the same boss, they all work the same way. Learn to use one, and you've essentially learned to use them all.

Visi On makes each application the best you ever worked with, no matter which you're using. Never have individual applications performed more efficiently, more easily, or more powerfully.

Moreover, the strength of each application is actually boosted when you *combine* them.

Indeed, Visi On demonstrates its true genius whenever you want to do a number of things at once. Before now, going from a database to a spreadsheet to business graphics on a computer required rifling through a stack of different program disks and a bookcase full of instruction books.

Now, with Visi On, *each application can talk to the other.* You're free to transfer words, numbers, formulas, even entire charts, from one place to another. Noodle, fix, futz. No fumbling floppy disks. No forgetting instructions. Just analyze, experiment, refine, decide, and move forward.

Applications appear on the screen as windows, representing workspaces. To open a window, you point a hand-held pointer called a "mouse." Two buttons on the mouse control your options.

It's simple to learn, and even easier to use. There are only a few basic commands, and they remain in sight at all times.

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You see, you're buying Visi On from VisiCorp, the leading maker of business software. No one makes more useful, more powerful software, either (just ask over a million people now using VisiCalc®). And no one supports it better.

Finally, your computer will be everything you always wanted it to be.

Visi On will never let it be anything less.

VISI ON™

CIRCLE 68

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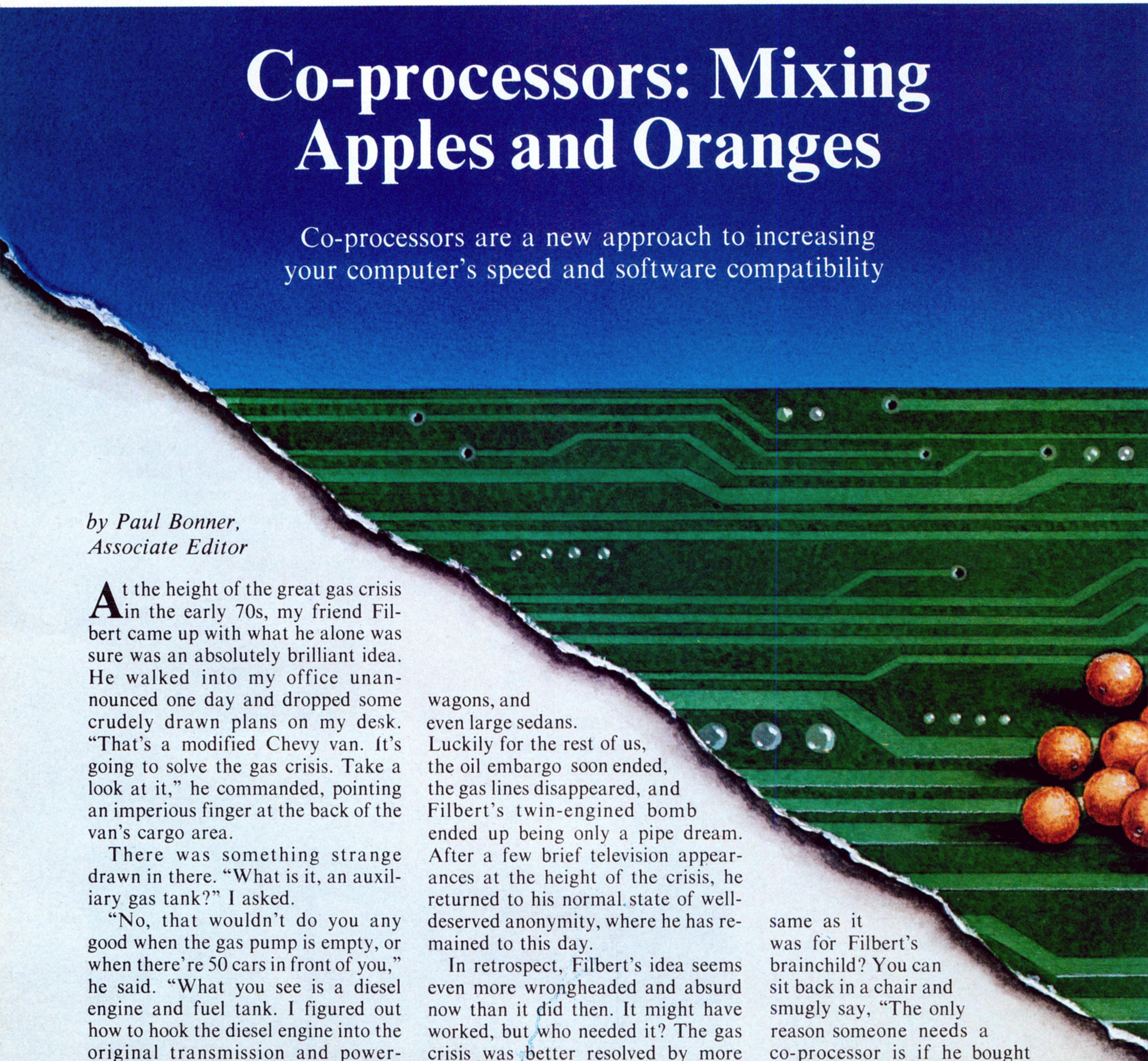
Co-processors: Mixing Apples and Oranges

Co-processors are a new approach to increasing your computer's speed and software compatibility



by Paul Bonner, Associate Editor

At the height of the great gas crisis in the early 70s, my friend Filbert came up with what he alone was sure was an absolutely brilliant idea. He walked into my office unannounced one day and dropped some crudely drawn plans on my desk. "That's a modified Chevy van. It's going to solve the gas crisis. Take a look at it," he commanded, pointing an imperious finger at the back of the van's cargo area.

There was something strange drawn in there. "What is it, an auxiliary gas tank?" I asked.

"No, that wouldn't do you any good when the gas pump is empty, or when there're 50 cars in front of you," he said. "What you see is a diesel engine and fuel tank. I figured out how to hook the diesel engine into the original transmission and powertrain, so you have your choice of using either gas or diesel fuel. You can always get one of them."

Yep, Filbert was sure his idea would make him a millionaire. He envisioned a huge factory, working 'round the clock putting auxiliary diesel engines in vans, station wagons, and even large sedans. Luckily for the rest of us, the oil embargo soon ended, the gas lines disappeared, and Filbert's twin-engined bomb ended up being only a pipe dream. After a few brief television appearances at the height of the crisis, he returned to his normal state of well-deserved anonymity, where he has remained to this day.

In retrospect, Filbert's idea seems even more wrongheaded and absurd now than it did then. It might have worked, but who needed it? The gas crisis was better resolved by more fuel-efficient cars, a variety of conservation measures, and better relations with the Saudis.

The same question—who needs it?—might now be asked about almost any of the co-processors being sold for the personal-computer market—but will the answer be the same as it was for Filbert's brainchild? You can sit back in a chair and smugly say, "The only reason someone needs a co-processor is if he bought the wrong computer in the first place and doesn't want to admit his mistake." You *can* say that—but you might be wrong, at least part of the time.

A co-processor is a microprocessor (usually supplied on a plug-in board along with any other chips necessary

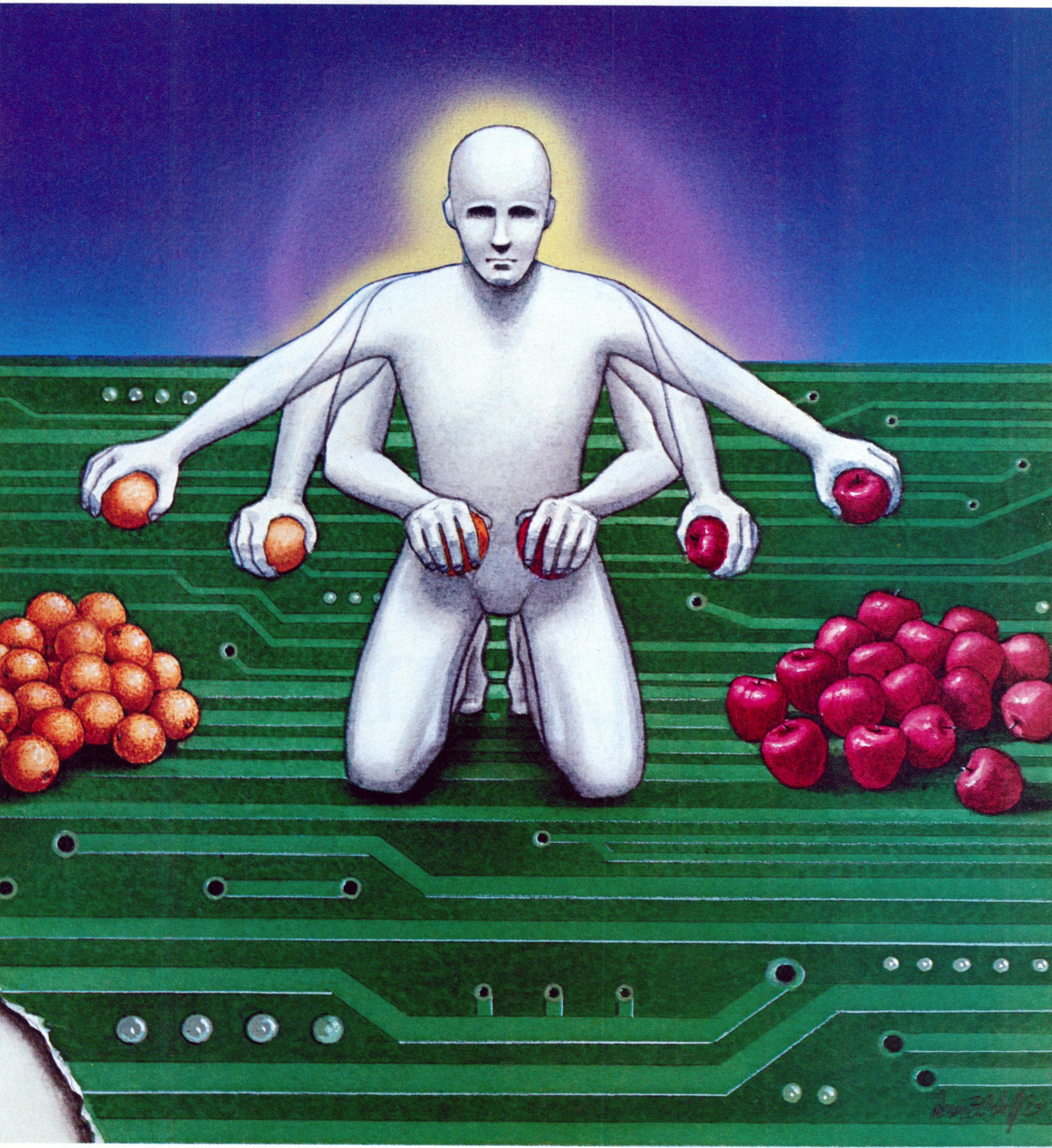


Illustration by Denis E. Orloff

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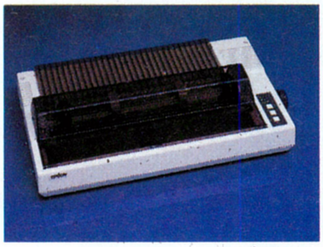

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CIRCLE 174

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People buy co-processors for three reasons: speed, compatibility, and status.

to use it) that works alongside—or more frequently, in place of—the microprocessor which the manufacturer of your computer has supplied. The original (or host) processor and the co-processor share your computer's disk drives, keyboard, modem, and other peripherals. But since the co-processor usually uses a different operating system than the host processor, it requires (and by the same token makes available) a different library of software.

There are three reasons why someone might buy a co-processor for a personal computer: compatibility, speed, and status. An Apple II owner, for instance, might buy a CP/M Card from Advanced Logic Systems (A.L.S.) Inc., to let him run CP/M applications, or an Accelerator board from Titan Technologies, Inc. to nearly quadruple the speed at which his computer executes Apple programs, or a Graphics System board from Number Nine Computer Engineering Inc., that will allow him to boast, "My computer has the hottest graphics this side of a video arcade."

In most cases, it's probably a combination of those three factors that makes someone buy a co-processor. That isn't surprising, since all three are very important concerns in the personal-computer market. Speed is the reason most people use a personal computer in the first place—it lets them get their job done faster than they could do it without one. Compatibility is also of obvious importance—you want to be able to use the software that will best do the job, and to exchange data with your co-workers. Status is a bit less tangible, but it can also be important, whether you derive it from the name and public image of the manufacturer of your machine, or from being able to boast about the fact that your quiet little 8-bit computer has a 32-bit, 14 MHz Motorola 68000 microprocessor roaring away inside its case.

But when all is said and done, there remains that accusation: Co-processors are for people who made a mistake. Is it true? A look at some of the co-processors on the market and what they do would seem to indicate that the answer is "no."

Walls and bridges

To date, the most popular co-processors have been those that address compatibility problems—that let you run software written in operating systems normally not provided by your computer. If you own an IBM, you can buy cards that purport to let you run either Apple or 8-bit CP/M software, while if you own either an Apple or a TRS-80, cards purporting to let you run either CP/M or IBM software are available. The reason for all this miscegenation is that, as George Johnson, director of marketing for A.L.S., Inc. explains, "There are standards in the personal-computing industry. Unfortunately, there are several standards. There just isn't one operating system or one base of software that all personal computers will run."

People buy co-processors, Johnson says, because "they want access to some kind of software that doesn't run on their machine without one. You can say, 'For Pete's sake, just buy the computer, you can buy a thousand dollars worth of Apple or PCjr and you've got access'—but of course there are problems with just buying a system; it's more of an investment than the basic list price would indicate. You then have to invest in peripherals, monitors, disk drives, modems, etc.—the actual cost is $3000 or $4000 per system."

The alternative, Johnson says, is a co-processor. "Our business definition is that we try to devise a way for somebody who bought a machine that, like most machines, comes with one or at most two operating systems, to reach out to an island of software that he normally can't access. We view that business as building bridges. . . . We argue that there are, for instance, people who bought the IBM Personal Computer who would like to be able to run software for other operating systems—CP/M or Apple DOS. They can't get to those applications with the 8088-based system they bought, but they can get there if someone builds a bridge for them."

But why would anyone want to reach out to a different "island of software?" Glen C. Karp, marketing coordinator of Personal Computer Products, Inc., (PCPI), manufacturers of the Appli-Card CP/M co-processor for the Apple II, says, "There are at least 20,000 business programs written to run under the CP/M operating system. By plugging in a Z80 board, the Apple owner is exposed to literally thousands of applications programs that otherwise would not run on an Apple II computer." The same CP/M business library is open to the IBM or TRS-80 owner who plugs in a CP/M board.

The point is that as long as several viable operating systems continue to flourish in the personal-computer market, not every program that you need will necessarily be available for the operating system with which your machine is equipped. That's true no matter whether you own an IBM, an Apple, a TRS-80, or any of several dozen other brands. And according to George Johnson, the multitude of operating systems is likely to persist for some time. "It may never become true that there is one operating system and one set of software that will run on all computers in the 1990s," he says. "Of course, some people will tell you that MS-DOS is the one true standard, and that people will forever love MS-DOS, and that it's brought order to chaos," he continues. "But of course the fact of the matter is that MS-DOS will not be accepted by the makers of 68000 (the 32-bit Motorola 68000 microprocessor) and hotter microprocessor-based machines in the future because it's inadequate for their needs . . . with UNIX the world may

> *"We view our business as building bridges . . . to reach out to an island of software."*

move beyond MS-DOS to yet another new standard—which requires that somebody out there realize that this incompatibility not only exists today, but will continue to exist for some time in the future."

How much compatibility?

If Johnson's right, then the case can be made that co-processors which offer compatibility with different operating systems are and will continue to be very valuable peripherals. Of course, the extent to which they are valuable depends a lot on how much compatibility they really provide—that is, how well they do their jobs.

In some cases, they do their jobs exceptionally well. Because programs written to run under CP/M are designed to be portable from one machine to another, co-processors that provide CP/M compatibility can provide significant benefit to the user. Although "the chief inconvenience of running CP/M on an Apple is insufficient disk capacity," according to Johnson, he adds that "you can eliminate that with a hard disk or a higher-capacity floppy disk drive." If you do, he says, "There's virtually no difference between an Apple running CP/M and an Osborne or Kaypro or anybody's CP/M machine. In some cases you get better performance (in terms of speed) on the Apple, sometimes worse performance, depending on the microprocessor."

The first CP/M co-processor for the Apple II was Microsoft's SoftCard, which used a 2.01 MHz Z80 processor, as have many of the CP/M cards for the Apple II that have followed the SoftCard. But the transportability of CP/M programs is such that they really are not dependent on the speed of the microprocessor, so that the same program written for use on the SoftCard will run on PCPI's 4 MHz and 6 MHz versions of the Appli-Card, although they will run much faster. In fact, PCPI's Karp says, "I know of no program that will not run because of the increased speed." He adds, "The technical speed doesn't matter to users, but the plain fact that their programs are going to run much faster if they're doing a large data-base sort or something like that is a major benefit."

The smoothness with which CP/M co-processors run on the Apple has led to a rather startling situation. According to Johnson, the 6502-based Apple II, which, as sold, runs only Apple's proprietary operating system, is the most popular Z80-based CP/M computer in the world. Johnson says, "There are probably 300,000 Apple IIs running CP/M. That's about twice as many as anyone else."

Other co-processors have a more difficult task, and may not succeed as well. Quadram's Quadlink, for instance, provides IBM owners with only limited Apple compatibility. Some software—notably games with fancy copy-protection schemes—will not boot when you use Quadlink to turn your IBM disk drives into pseudo-Apple drives. It's also apparent as you use it that a Quadlink-equipped IBM is a rather limited reflection of an Apple II. It lacks one of the II's best features—its versatility and expandability. You're stuck with a 40-column display, since there's no way to add an 80-column card to Quadlink, and you're stuck with 64k of memory. Thus, for someone who's been using an 80-column word processor on an Apple, or VisiCalc with pre-boot software that lets it use 80 columns and several hundred kilobytes of memory, and who now wants to or has to work on an IBM Personal Computer, Quadlink is not a wholly satisfactory solution.

PCPI offers Apple owners a product called the 88Card, which at first glance appears to make the Apple II IBM compatible. However, once again the extent of that compatibility appears to be limited, for a number of reasons: (1) the PCPI 88Card can address only 128k of memory (64k of your Apple's memory, and 64k of its own on-board memory); (2) Apple drives cannot be made to read IBM's double-density disks; and (3), the Apple's keyboard lacks the function and editing keys found on the IBM keyboard. PCPI's president Ed Savarese foresees the day when software houses will provide Apple-formatted IBM programs that will run under MS-DOS, but admits that at this time, "the primary function of the 88Card is as a developer's tool." Glen Karp adds, "Quite honestly, the 88Card is not for the casual user who works from 9 a.m. to 5 p.m. in the office and wants to come home and run IBM software on his Apple. It's for the large body of Apple programmers, for whom it provides a link to develop MS-DOS applications on an Apple."

Recently, Apple Computer, Inc., and Rana Systems, Inc., jointly announced the Rana 8086/2 co-processor/dual-disk system for the Apple IIe. The system includes the two double-sided, double-density 360k drives needed to read IBM-formatted software, as well as 256k (expandable to 512k) of RAM. It uses the Intel 8086 microprocessor rather than the 8088 used by IBM, so the degree to which it will be compatible with the software written for the IBM Personal Computer is questionable. However, Lotus Development Corporation has already announced that it will provide a version of Lotus 1-2-3 to run on the 8086/2. In addition, Rana was one of 23 hardware manufacturers to demonstrate its support for Microsoft's recently announced Windows operating environment by attending the press conference at which Windows was introduced. Windows is designed to allow for greatly increased transportability of programs between MS-DOS systems running on different hardware platforms. It's possible therefore—assuming that enough software suppliers support Windows—that there will be a good deal

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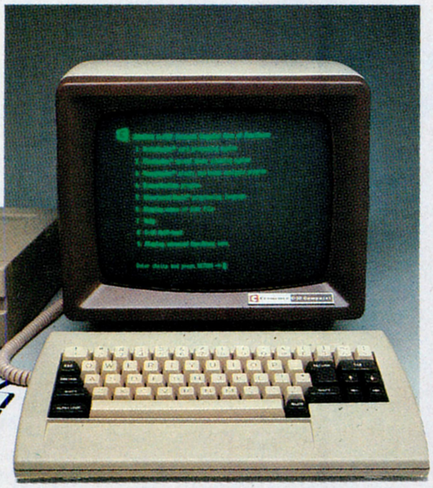

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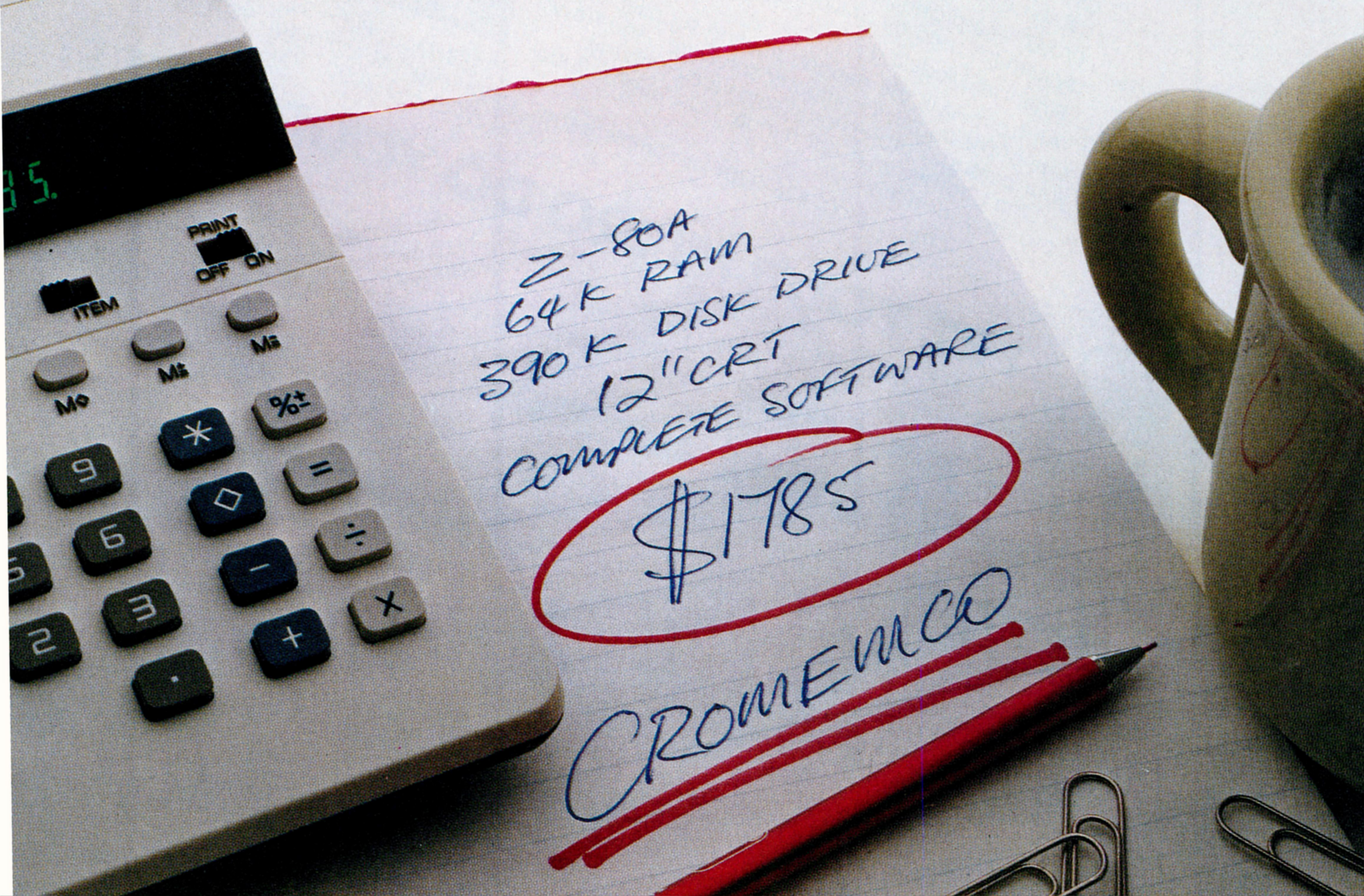

The 8087 may increase your speed up to 20,000 percent depending on your software.

of software available for the 8086/2.

Still, it remains to be seen how useful the 8086/2 will turn out to be. George Johnson comments, "It sounds like it's going the wrong direction, doesn't it? Trying to take a machine that's as big as the IBM Personal Computer and squeeze it into an Apple is a much more difficult task than going the other direction. Taking a Z80 card and putting it into an IBM, or taking a 6502 card and putting it into an IBM is a lot easier to accomplish, because you have a super-set of the functions that are required to support that software. So I agree to an extent that the Rana box looks like a very interesting technological feat, but not quite as useful as you would expect it to be."

Fran Mulvania of Rana Systems anticipates two major markets for the 8086/2. The first is the current Apple IIe user who wants to continue using his IIe and his Apple software but wants access to Lotus 1-2-3 and other programs running in the MS-DOS/Windows environment. In addition, she feels that the presence of the 8086/2 may convince people currently vacillating between buying an Apple IIe and buying an IBM Personal Computer to buy the Apple, since the 8086/2 offers MS-DOS compatibility for a relatively low price ($1795). She points out that the 8086/2 buyer will have access to the unit's high-capacity disk drives even when operating in Apple mode.

Speed demons

Let us now leave the confused and turbulent world of operating system compatibility, or the lack thereof, and examine the second reason for purchasing a co-processor. The second type of co-processor that might be worth a look is concerned not with letting your computer run software intended for other systems, but with vastly increasing the speed with which your computer runs its own software.

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CIRCLE 70

The 65802 puts the Apple in the same performance class as the IBM for math.

speed demons (although for reasons that will become obvious it remains little more than a rumor in most people's minds) is the Intel 8087 math co-processor. When the IBM Personal Computer was first introduced, some bright-eyed reporter noted that there was an empty 32-pin socket right next to the main 8088 microprocessor on the system's motherboard, and sure enough IBM admitted that the socket was intended for the 8087.

What does the 8087 do? Well, according to Richard Startz, author of *8087 Applications and Programming for your IBM PC and other PCs* (Robert J. Brady Co., Bowie, Md., 1983), it increases the speed at which an IBM Personal Computer does math computations by a factor ranging from six to 40. "That's the difference in the hardware between the 8087 and the 8088," he says. "Now depending on the software, you can get anywhere from zero increase—and that's really easy—to extreme examples like 200 times as fast."

Two hundred times as fast? That's 20,000 percent. And you can buy an 8087 co-processor today for just $260. As Startz says, "Even if this chip only makes your $5000 computer 10 times as fast, in some ways that's like getting a $50,000 computer for $260 dollars." Pretty impressive. But before you raid the penny jar and cruise down to your local IBM dealer to buy one of these marvels, there are a couple of things of which you should be aware.

The first is that, as Startz explains, "all the 8087 does is speed up math. If you do word processing, it's absolutely irrelevant." He adds that he doesn't expect the 8087 to have much effect on applications such as accounting or data bases, "because in those applications you're never really waiting for the CPU (the 8088 central processing unit) anyway . . . the thing that really holds them back is how fast the disk drives operate. If you're spending 90 percent of your time waiting for the disk drives, it doesn't matter if you get your CPU faster by a factor of 1000."

By a process of elimination, that would seem to leave us with spreadsheets as the primary application which would benefit from having a 8087 co-processor, right? Right, Startz says. "A lot of people who have heavily numerical applications can fit an application into their computer, and it executes just fine, but right now it takes an hour to compute. Depending on their software, they might reasonably expect to get it down to 10 minutes with the 8087, and in some extreme cases they'll do it in a minute instead of an hour. Essentially, that means that many things that up to now weren't feasible on a personal computer all of a sudden really do become feasible."

The problem is that unless you're a proficient programmer—say, good enough to knock out something like Lotus 1-2-3 in your spare time—installing the 8087 won't even speed up your spreadsheets today. Like any microprocessor, the Intel 8087 has its own set of instructions, and it acts only on its own instructions, ignoring those intended for the main 8088 processor. Startz explains, "To use this chip, you have to have the specialized instructions it uses built into the software. That hasn't happened, because nobody has installed the chip—so why should a software developer build in the instructions? At least to my knowledge, none of the commonly used spreadsheets use this thing yet. They will soon, but they don't yet."

Several manufacturers of popular spreadsheets for the IBM Personal Computer have hinted that they are developing versions of their products that will take advantage of the 8087, but at this point none have made any announcements as to when the new products will be released.

For IBM owners who want a more immediate solution to the problem of speed, Titan Technologies, Inc. has just announced The Accelerator PC, a plug-in board for your computer that contains a 10 MHz 8086 microprocessor and 128- to 576k of high-speed RAM. The 8086 is a true 16-bit microprocessor, as opposed to the 8088, which has only an 8-bit data bus, and it runs at twice the clock speed of the 8088. Titan states that The Accelerator PC will execute all instructions two to four times as fast as the 8088. It claims that it is transparent to the system and will run the vast majority of software for the IBM. For those times when you don't want that speed—such as when you want to play a game that would be impossible at two to four times its normal speed—The Accelerator PC will be equipped with an exterior switch that allows you to turn it off and thus turn all processing duties back to the 8088. Otherwise, The Accelerator PC takes over all processing within your computer. For those who want a super-fast system, the board also contains a socket for an 8087 co-processor. Titan expects to begin shipping The Acclerator PC in February, with a suggested retail price of $1000.

For Apple II owners, speedy relief is already at hand in the form of Titan Technologies' Accelerator II. For a suggested retail price of $599, The Accelerator II provides users with a plug-in card containing a 6502B microprocessor which operates 3.6 times faster than the 6502 on the Apple II's motherboard, with 64k of high-speed RAM. The Acclerator II, like The Accelerator PC, simply takes over all processing (except disk I/O and other functions utilizing the direct memory access line on the bus) from the motherboard processor, so that any program you load into memory will run nearly four times faster without modification. The Accelerator II can also be easily disabled if you want to run a program at normal 6502 speed.

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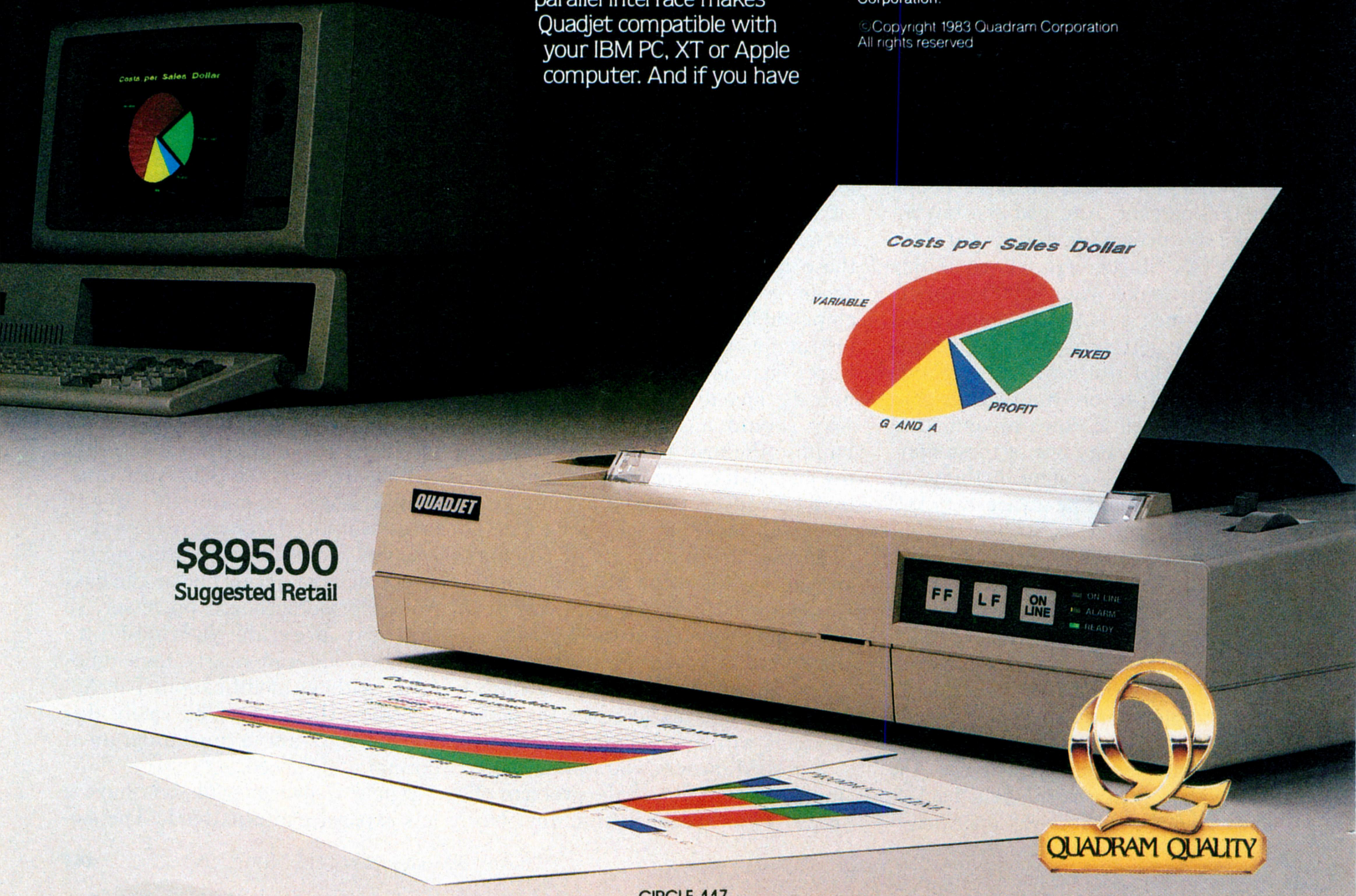

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CIRCLE 117

For co-processors, it's not "buyer beware," but "buyer, be aware."

celerator II, in the form of a 65802 microprocessor developed by Bill Mitch at Western Design Center, and being distributed by Hayden Software. David Eyes, director of technical product development for Hayden, says that the 65802 "is a 16-bit version of the 6502. It will make no difference in the way that old software for the Apple runs, but new software taking advantage of its new instructions can utilize the chip for 16-bit operations." The chip is plug-compatible with the 6502 on the Apple II's motherboard, and doesn't require high-speed RAM chips as does the 6502B used by The Accelerator II, so users can simply pull their 6502 out of their computer and plug the 65802 in (or have their dealer do it for them). To facilitate the development of software for this new chip, Hayden Software is developing a version of its popular ORCAM assembler that will include the 65802 instruction set, as well as a Pascal compiler and an operating system.

Eyes says that the 65802 "definitely will put the Apple into the same performance category as the IBM Personal Computer on math operations." It will increase the speed of most math operations, memory addressing, and block movements of memory about 3.5 times.

"Development of software taking advantage of the 65802 will either happen very quickly or it's not going to happen at all," Eyes says. "I'm betting that it's going to happen very quickly because it's so close to the existing processor in the Apple—it's an extension of the existing processor and it's so easy to find ways to improve a program's performance using it," he continues. As for how the chip is likely to find its way into end-user's computers, he says, "Somebody could just say, 'This is a great chip, I'm going to write a spreadsheet using it that will make VisiCalc look sick, or a word processor that will make PIE:Writer look sick, and I'm going to sell the program for $250 and give people the chip, because the chip is going to cost me less than $20 and it will promote my software.'" He adds that Hayden Software is also likely to put together an Apple II upgrade package including dealer installation of the chip, and sell it as a consumer package.

Rare birds

We now turn to the haziest area of all, a series of boards as esoteric as they are powerful. You can make your computer perform beyond your wildest dreams with one of these items, but more than likely you'll have to do it without much, if any, software support. Take, for instance, the Saybrook co-processor.

According to Mark L. Tompkins, vice-president of production at Analytical Engines, Inc., manufacturers of the Saybrook, it's a board for the Apple II that contains a Motorola 68000 microprocessor (the same microprocessor used in Lisa and Macintosh) running at eight to 14 MHz, with 128- to 512k RAM. The 14 MHz model makes your Apple into the fastest personal computer on the market, by the way. Tompkins says, "We are allowing the user who is limited by the operating speed of the Apple II to upgrade without buying another machine. At a fraction of the cost of buying an IBM Personal Computer, we update him to the state-of-the-art in systems."

But, as George Johnson of A.L.S. asks, "What do you do with it?" Tompkins says that you can run 99 percent of all Applesoft programs, as well as recompiled Pascal and FORTRAN programs, at speeds 10 to 20 times as fast as they ran on the 6502 microprocessor on the Apple II's motherboard. But, one must ask, what about 6502 machine-language programs? (Almost every decent program for the Apple falls into that category.) Well, the Saybrook board won't run those, and that's a shame, because it's easy to get your mouth watering at the idea of VisiCalc or DB Master running on a 32-bit, 14 MHz processor with a half a megabyte of RAM.

Recognizing this, Tompkins says, Saybrook customers are offered "a bundled package including a multidimensional spreadsheet called Timberline, which is really big on minicomputers, a totally relational data base called Alladin, a word processor with an integral spelling checker, and a communications package."

There are also a number of development tools available for the Saybrook board, including Pascal, FORTRAN, and BASIC compilers. But the fact is that there are only so many people who will pay $1500 for a co-processor for their Apple. You might look at the Saybrook board as a tool to help you develop 68000 applications on an Apple. But it's questionable how useful an Apple—with its limited capacity disk drives and minimalist keyboard—would be for that purpose. More frequently, I suspect, the Saybrook board is purely a prestige item. Owning one is like owning a sports car that can move at 180 mph on the open road. The times that you'll use all that power will be few and far between, but it's nice to be able to mention that you own one while enjoying an after-dinner cigar at the club.

An even rarer bird, perhaps, is the Number Nine Graphics System from Number Nine Computer Engineering Inc., which for something over $900 bundles an NEC 7720 VLSI Graphics Display Controller and a megabit of RAM to offer Apple and IBM owners the ultimate in high-resolution animation and color graphics. Even BASIC programs controlling a board like this produce super-smooth animation, and machine language programs produce almost unbelievably good displays in record time. The display is truly wonderful, but software support from third-party vendors is non-existent, so if you want to take advantage of

(continued on page 201)

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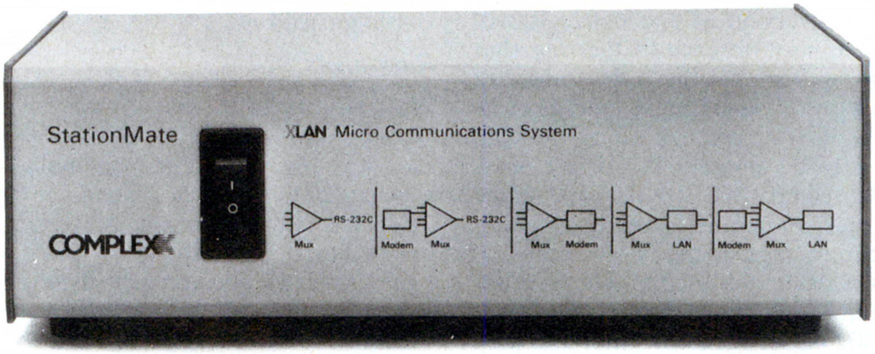
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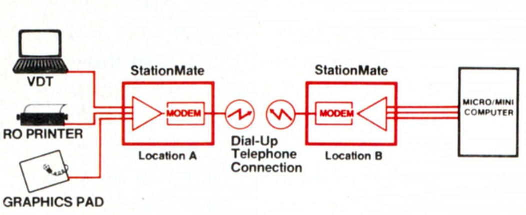
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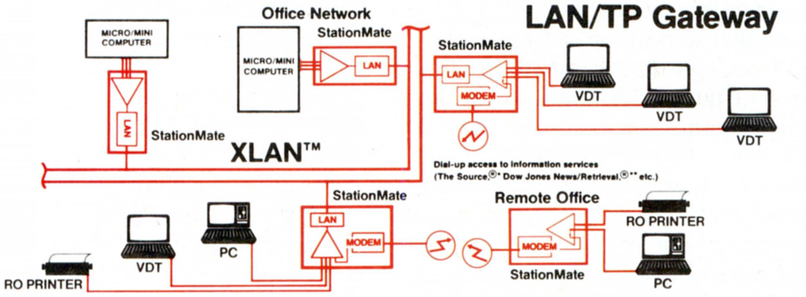
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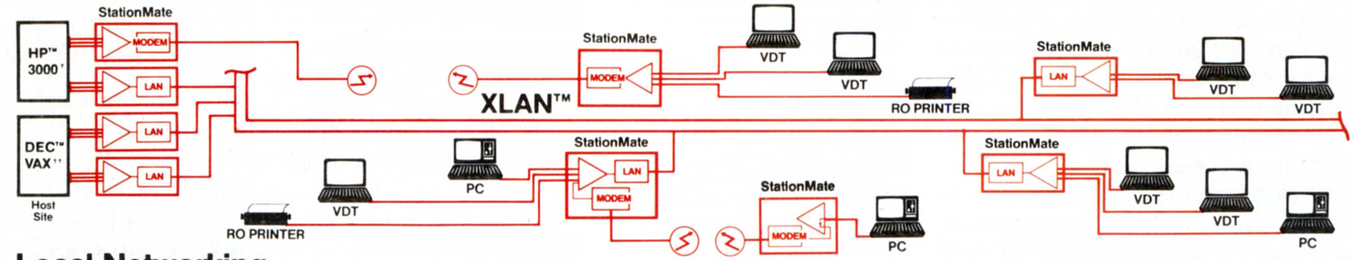
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CIRCLE 138

Toward a More Thoughtful Use of Computers in Education

Computers *are* getting into our schools, but what's *really* happening to them once they get there?

By Paul Bonner, Associate Editor

Consider these statements:

(1) I write about computers for a living.

(2) Until three years ago, my only contact with computers was a programming course in FORTRAN. I did poorly, and passed it only because my professor had a weak spot for seniors who needed science credits in order to graduate.

(3) Throughout most of my life writing has been my primary interest.

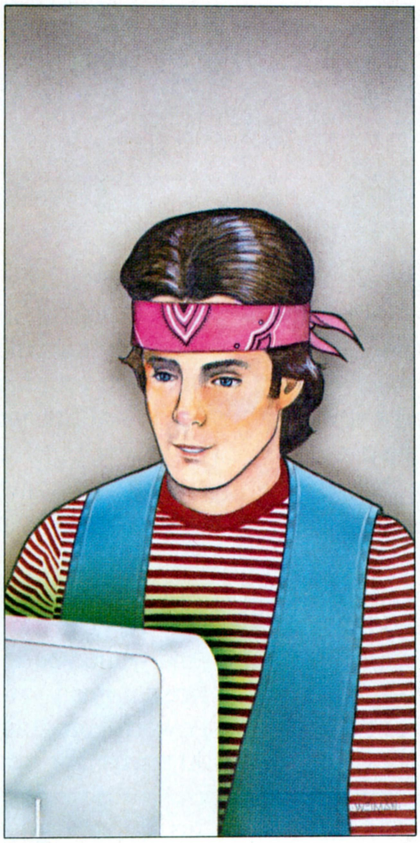
(4) Lately, I get as much if not greater joy from programming than I do from writing.

(5) I habitually distrust technological innovations that people say will improve my life.

(6) I won't even consider writing anything if I can't do it on a word processor.

A rather diverse collection of statements, no? Perhaps you think they were made by two people who don't get along. Actually, they're all being made by the same person: me. And they're all true.

The fact is that there's nothing about my background to indicate that I would ever become interested in computers. And yet, despite a horrifically boring experience with mainframe batch processing and punch cards in college, and despite the endless barrage of overblown new product announcements and PR hype that lands on my desk now, I am very excited about personal computers, and readily admit that my life actually has improved since I've become involved with them. The question is: Why? Why have I become so enamored with these machines?



Illustrations by Jon Weiman

Play may be the best way to begin the on-going relationship students will have with computers.

The answer is play. I began playing with personal computers about three years ago when, with a friend's help, I wrote my first program—a 10- or 20-line routine to make a Timex/Sinclair 1000 write random poetry. That was fun. And today—whether I'm using a word-processing package to write a story for *Personal Computing*, or using a data-base program to keep track of names and numbers, or writing a program to help the production staff put the magazine together, or even fooling around with a game—it's still fun, and it still feels like play.

Of course, it's been profitable play. I owe my present job to it, and my last one, and a fair number of trinkets that free-lance programming jobs made it possible for me to afford. But for me, the joy of play has been far more important.

I suppose I could have been more systematic about my approach to computers. I could have sat down and tried to go through manuals and programming guides or maybe taken a "computer literacy" course or two. But that's like sitting down and reading a "great" book not because you want to, but because you should. It's the mental equivalent to factory work, something that dulls rather than enriches the mind. And all of my experience tells me that if I had tried that kind of approach I would have failed, because without the joy of dis-

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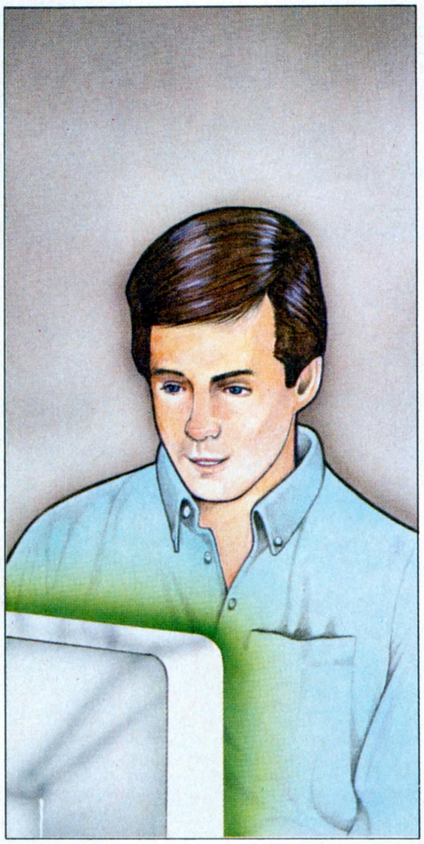
CIRCLE 132

When learning lacks the joy of discovery, part of the mind shuts down.

covery and exploration that comes from approaching learning as play, that part of the mind which can take isolated facts and turn them into concepts, or see through the complexities of a problem to the simple elements that compose it, shuts down.

I spoke to Nels Winkless, a former editor of *Personal Computing* and now director of corporate communications for Excalibur Technologies Corporation, about this subject. He says, "The standard training mechanism—where you sit down and you get a little bit of an introduction and they say 'Here's what we're going to accomplish, but first you must learn these rules'—absolutely turns me off. I don't mean in terms of annoyance, I mean I can't work that way. I've got to go in and rummage around and then kind of derive the rules." He adds that the standard training method "certainly impedes learning how to use a computer from the point of view of anyone who is not inclined to work on a rule-driven system."

For proof of that, watch sometime when someone with a vague desire to become "computer literate" tries to do so by going through a tutorial program intended to teach one how to program in BASIC, where the first lesson introduces FOR-NEXT loops, the second introduces IF statements, the third introduces random numbers, and the fourth tries to tie them all together with an exercise of some sort. The problem is, there's no point to the endeavor. It doesn't do anyone any good to know that the instructions "FOR X = 1 TO 10 : PRINT X : NEXT X" will make a computer print the numbers one through 10 on the screen if they don't have any reason to want to know that—if they don't know why they'd ever use those instructions. The difference between learning how to program through drill and learning through play is that with the latter approach, you begin not with the statement "This is how you make a computer count to 10," but with the question, "What would you like the computer to do?" And only when the answer is "I would like it to do something 10 times" do you teach them how to make the computer count.



Experimenting with the computer unfolds the machine's capabilities and power as a tool.

As Winkless would put it, I rummaged about as I learned to program, learning about strings and random numbers with that first poetry-generating program, learning about sequential text files while writing a bookkeeping program, learning about shape tables and graphics commands by writing a high-resolution tennis game, and so on. And in the end, I believe that was the best approach I could have taken, because it transformed work and study that could have been horribly dry if approached more methodically into something described as joy and play. By now I'm sure any curiosity you may have had about the education of an associate editor at *Personal Computing* has been sated. But I'd like to believe that there's a more important point to all of this. That is, that a similar, playful approach may be the solution to preparing our children for the world in which they will live and work as adults.

A child entering school today will begin work in the 21st century. No one can predict what the world will be like then, but it does seem safe to assume that computers will become even more important than they are today.

How can we ensure that our children are comfortable in the computer age? One of the first steps is to put computers into schools, and that's already being done. Unfortunately, up to this point, getting computers into the schools has not necessarily meant that our kids actually end up with their hands on the machines. Instead, for every school where computers are being used creatively and to their full potential in the classroom, there are probably 10 more where the computers sit locked in closets because the administrators are afraid that the children will break them, or because the teachers resent, fear, or simply don't understand how to use them. And when the computers are pulled out of the closet, more often than not it's by a teacher who wants to use one to keep records of attendance or grades, or by a school board member who wants to use a spreadsheet to keep track of the school district's budget. With far too few exceptions, the kids for whom the computers were intended never even get close enough to one to touch it.

There are a lot of reasons for this, but they all boil down to the fact that nobody has really determined what our children should do with computers. That's understandable—in a way

(continued on page 159)

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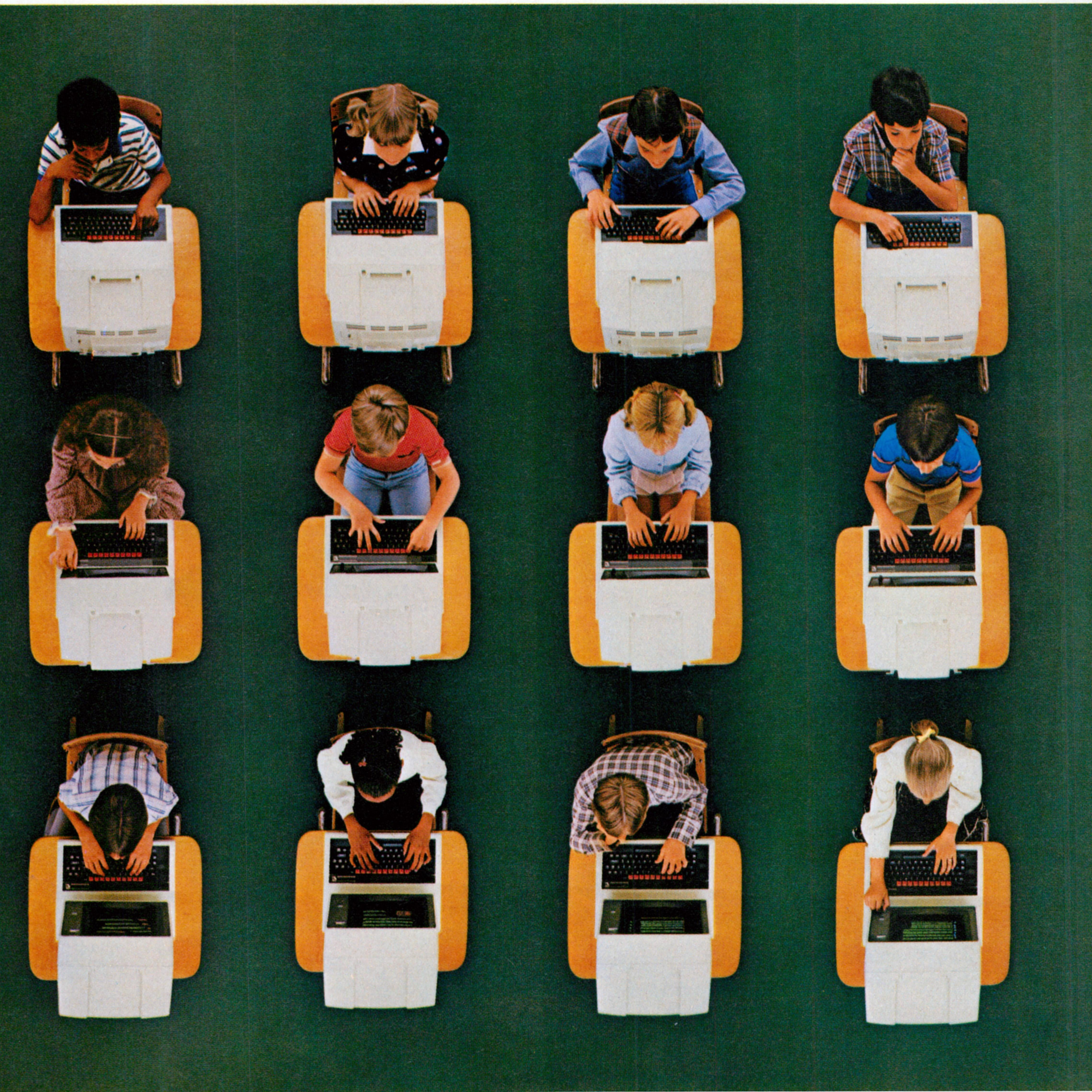

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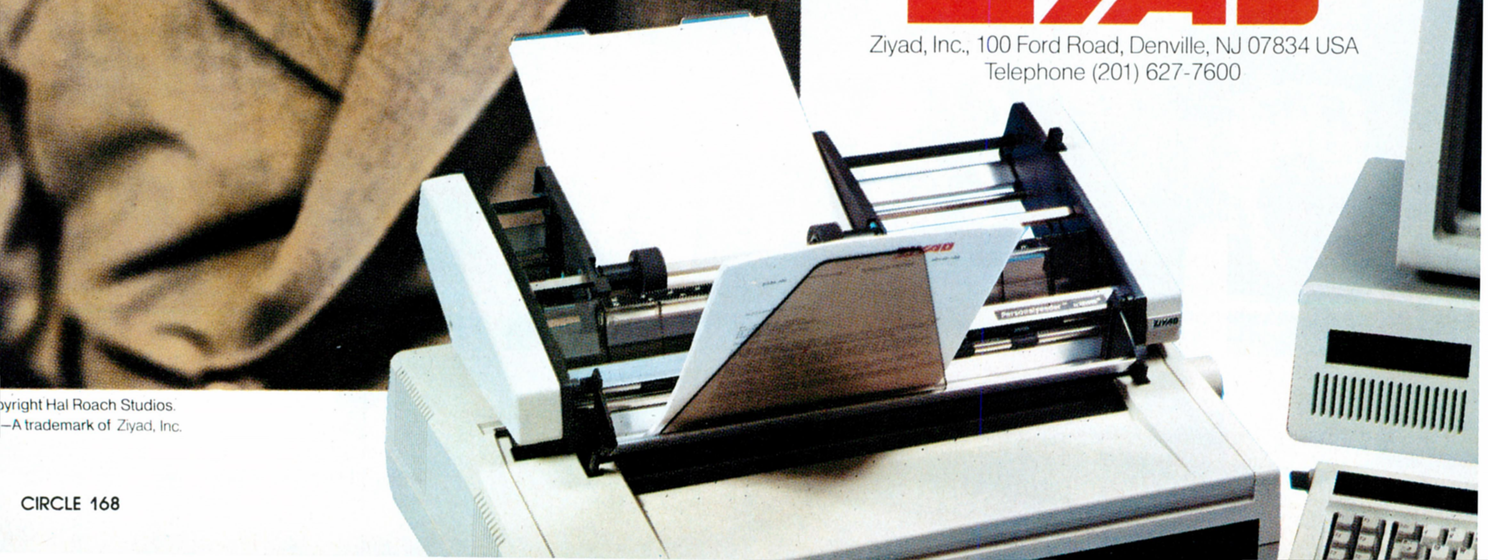

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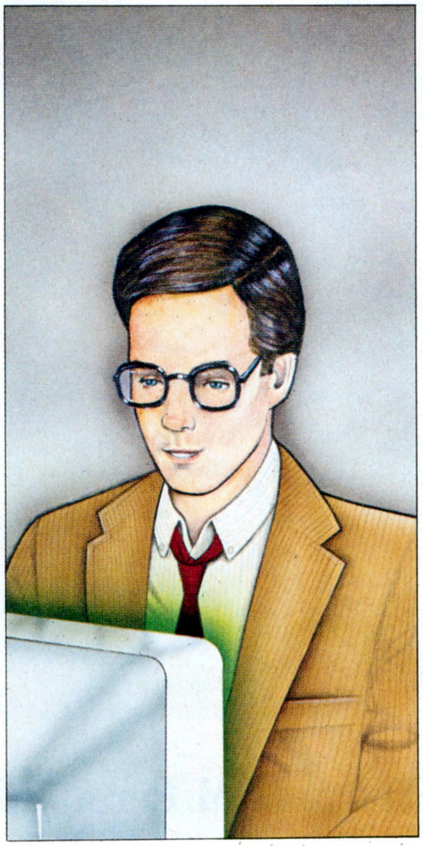
(continued from page 155)

—since personal computers are recent innovations, and they are unlike any other classroom accessory. No blackboard, no workbook, no filmstrip projector ever changed the very nature of education in this country. But if they are used correctly, with insight and imagination, computers very well *could* change that nature, and change it for the better. The power of these machines is that great. The question is, how should we use that power? Or rather, how should our children use it?

The answer from this corner is *let them play*. Let them experiment. Let them grow comfortable with the machines. Let them see the power of the machines—and the power the machines give them. Let them do whatever they want.

It sounds dangerous, doesn't it? Unstructured. Anarchic. And we all know what the little moppets will do—they'll just play Pac-Man all day if we don't supervise them well, and make them do something productive.

Or will they? Why assume that children, by nature, disdain learning? There's no biological imperative that says a little person who has spent six or seven years asking "Why?" with every other breath will suddenly lose all interest in the answer he gets. You can, of course, "teach" a child to lose interest by boring her or forcing him to do things he or she neither understands nor appreciates. There are probably a thousand ways to achieve that, but the important thing is that it's not inevitable. There is a choice—we can choose to teach our children to love learning. So why don't we take the educational opportunity presented by computers to do just that? The argument here is not for a total lack of structure in the educational use of computers, but rather it is a plea for an enlightened use of these machines—one which will encourage children to see that learning can be fun; it can be play in the way that my learning about computers was play. We cannot simply plug computers into our schools like a new textbook or an opaque projector and then get on with business as usual. Or rather, we can, but we shouldn't—for several reasons.



Using the computer as a tool leads to further experimentation and new discoveries about its use.

One is that our educational system just isn't working. You can measure that fact objectively by looking at declining test scores on standardized tests, or you can measure it subjectively by looking at the blank, bored faces that most children wear in the classroom by the third or fourth grade. Either way, the truth is that it's no longer safe to assume that a high school graduate has been taught to read, to write, to do elementary arithmetic, or to think.

Will computers in the schools help change that? Maybe. But not unless we use them imaginatively as part of a larger effort to find new approaches to education—approaches that encourage children to find delight in learning, and that prepare them for the society in which they will live.

The same computers we're now putting into our schools will have a major influence in shaping that future society. Chris Morgan, vice-president of communications for Lotus Development Corporation, illustrated this point at last spring's Applefest Boston when a member of the audience at his seminar on integrated software asked, "What will all this do to the middle manager who's been pushing papers since World War II?" At first Morgan joked, "Well, if he's been pushing paper that long he must be getting pretty tired of it." But then he answered in a more serious vein, "The people who are just pushing paper are going to have to do different things very shortly, or they're not going to be doing anything. That's because of the impact of the personal computer. We shouldn't have a lot of people pushing paper anyway; people should be doing more interesting things."

Morgan's answer suggests that just as automated machinery has displaced large groups of assembly line workers, the future will have no place for legions of number crunchers at adding machines or paper pushers busily collecting, sorting, and routing bits of information, because computers and electronic mail and mass data bases will do those jobs more efficiently than any human. Of course, some people will be needed to service the computers, but it seems likely that most of the people who in today's economy would end up organizing and sorting data, will in the future have to know how to actually think about and use that data.

Again, though, there is a choice. We can have a society of computer users who know how to manipulate

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CIRCLE 199

Discovery-based software helps develop the skills of the future: conceptualization and problem-solving.

and exploit the data a computer spits out, or we can have a society in which most of us are computer operators or servicemen.

If we want the former, more human, alternative, then it appears we must change the emphasis of our educational system. Of course, people will have to know how to do basic math, just as they should know something about the way computers work. Otherwise computer technology and the jobs computers perform will take on an unhealthy mystique, like the worlds drawn by science fiction writers in which people have forgotten that computers in the main perform jobs that people no longer want to do, rather than jobs that people can't do. As a species, it would be a bad move to forget how to add or subtract. That, more than anything, could lead to a world in which humans were reduced to optional equipment for the computer. But it is just as important that we teach children to evaluate the numbers a computer has crunched, to interpret the data a computer has sorted, to put together the results of the monotonous tasks we have turned over to computers in order to find creative and imaginative human solutions.

Today's educational system isn't doing that. Instead, we attempt—often unsucessfully—to make children proficient at the very tasks that computers are already beginning to assume. That approach to education doesn't seem to work now. and it probably won't work in the future. What might work is an emphasis on teaching creativity and conceptualization and problem-solving.

This idea is not as radical as it sounds. It doesn't mean that high school curricula should be revamped to emphasize finger-painting and creative gum-chewing. Far from it. Some very respected institutions have long recognized the need to emphasize creative approaches to problem solving. Look at Harvard Business School, which relies on the case study method where students are presented with the problems of XYZ Corporation and told to solve them. The point to those exercises is not that every future MBA will have to face those very problems and thus should learn by rote a solution to them, but rather they are intended to teach students to look at a problem and analyze its roots, and then find and work with every relevant piece of data to come up with a solution.

Skills learned in the computing process can be used to find innovative ways to solve new problems.

How can we teach the same skills in our grade schools and high schools? There are a number of ways, and wouldn't you know it, they're all consistent with the introduction of computers to the classroom. Discovery-based software, for instance, has already proven to be a great spur to creativity. This software deals not with right-or-wrong, true-or-false answers, but instead with relationships between the numbers and data that are used to solve a problem. The child using discovery-based software learns to see and analyze the subtle links between items that are important to the problem-solving process. The program presents a problem, and supplies the information necessary to solve it, but the child must infer the solution.

Programming courses will also be important in the educational process, but not for any of the reasons that one might first expect. There is no need to know how to program to become "computer literate," and in fact the vast majority of future—if not present—computer users will never need to program a single line of code to do what they want with a computer. But computer programming is an area that—like music or creative writing—requires rigid discipline while providing nearly unlimited opportunities for creativity. To program at all you must be disciplined, because you must work within the rules or syntax of a programming language to implement your solution to a problem. But you must also be creative enough to find that solution in the first place.

The ability of our society to flourish in the future rests upon how well we educate our children today. We can either encourage their creativity and help them become more adept at analyzing and solving problems, or we can continue to turn out disinterested and poorly educated graduates whose creativity and problem-solving skills have never been challenged, let alone encouraged. The way we use computers in our schools may very well be the deciding factor in which course we take, and in how well we can adapt the society in which we live to a world that is going to change drastically whether or not we prove ourselves capable of adapting.

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CIRCLE 157

Can Dot-Matrix Printers Meet Your Correspondence Needs?

If you have questions dealing with hardware, software, or applications, Personal Computing *will answer them in this monthly column. Please send your 'need-to-knows' to: Answers,* Personal Computing, *10 Mulholland Drive, Hasbrouck Heights, New Jersey 07604.*

Q: I've been reading about these new dot-matrix printers that offer correspondence-quality printing. Are they really an alternative to letter-quality printers?

A: We asked printer expert Brad Baldwin of Fremont, Calif., to give us his opinion on this question. Correspondence-quality printers use multiple passes on the ribbon to fill in the matrix holes. For this reason, the print quality comes very close to letter quality, Baldwin explains. "Nevertheless, the quality is not suitable for most business uses. If you need to present a professional image on proposals or reports, you don't want to use a dot-matrix printer," Baldwin warns. "You don't want to use anything associated with a computer printout."

Baldwin also points out that most dot-matrix printers don't offer the ability to change type styles, a feature available on letter-quality or daisy-wheel printers. Some letter-quality printers offer as many as a dozen different print styles to choose from.

Nevertheless, there are tasks well-suited to correspondence-quality printing, such as rough drafts, personal correspondence, and student papers. "In some environments, such as education, where absolute letter quality is not essential, correspondence-quality printing on a dot-matrix printer is an excellent alternative," Baldwin says.

He cites speed, low cost, and flexibility as the key advantages of dot-matrix printers. "There is also a lot of custom software available for dot-matrix printers that takes advantage of the dot-addressable graphics for pie charts and bar graphs," he adds.

Q: Is static electricity really a danger to my computer, and if so, how can I prevent my computer from being damaged by it?

A: Kevin Terrill, service manager at the Computer Repair Center of Santa Clara, Calif., says that on a dry day, 10 steps on a nylon rug can build up 10,000 to 20,000 volts of static electricity on the body. "If you build up that amount of voltage and point a finger at a computer component or a printed circuit board, you can cause its immediate execution."

According to Terrill, even touching a key or the frame of the computer can cause sufficient discharge to disrupt its operation or even damage it. Any data that had not already been saved to disk could be lost at that time.

Fortunately, Terrill says you can do several things to prevent static. First, if you can control room humidity, you should keep it at 50 percent or higher. Second, you should avoid using all types of carpeting, especially nylon. If you must have carpeting, natural fiber composition, such as wool, generates less static than synthetics, and anti-static treatments are available. Third, you can use anti-static floor mats and sprays to reduce static. The mats are not cheap, by the way, but they could cost a lot less than one trip to a computer repair center. Terrill offers his own spray formula: Fill a plant sprayer with one part water, three parts fabric softener. This formula won't damage or stain rugs, curtains and the like. Fourth, before sitting down to your computer, try and touch the metal part of a chair, pipe, or some other grounded object—even a doorknob. Anything that gives you a zap! will ground you. And you can prevent the pain of getting zapped by slapping whatever you're grounding to, rather than pointing at it. Pointing makes the charge leave your body from one small area, which can cause pain, wheras discharging the buildup over a broad surface area is painless. Fifth, people using computers should not wear static-prone synthetics.

Q: Is there a way I can free up my computer so I can continue to input while printing long documents?

A: Yes. A hardware device called a print buffer provides you with a small amount of additional memory for storage of data. This handy invention feeds the stored data to the printer at the speed the printer is ready to accept it, allowing you to edit and print simultaneously, according to printer consultant Brad Baldwin of Fremont, California.

Print buffers are connected through a printer port on your computer and are available from a number of manufacturers.

(continued on page 167)

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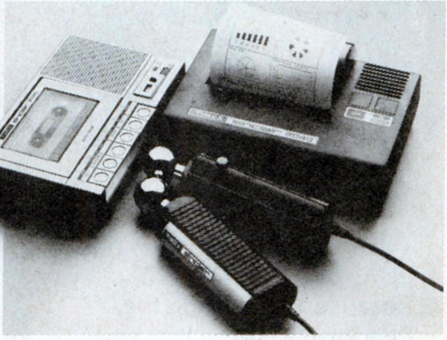

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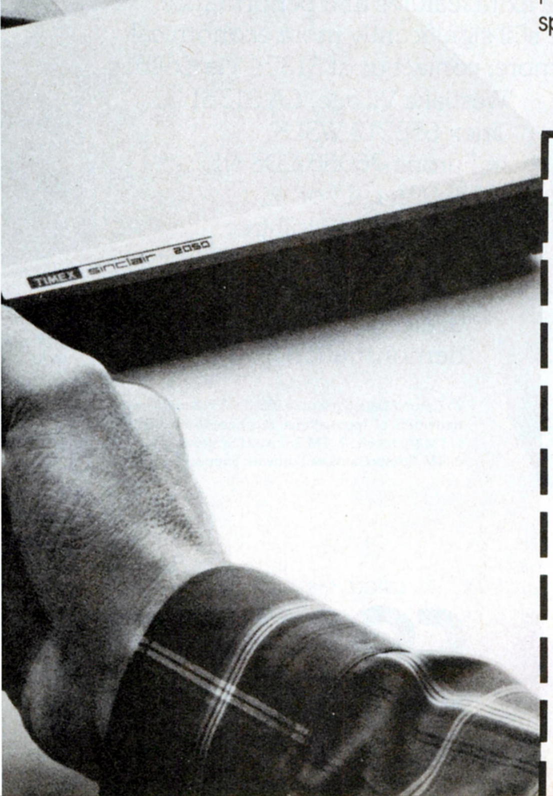

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CIRCLE 118

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(continued from page 163)

Q: I'm in the process of writing a very complex book. I must be able to refer to hundreds of books on different subject matters. Obviously I need a computer with a large amount of memory. Which one would you suggest?

A: It sounds like a program called Bookends from Sensible Software (West Bloomfield, Mich.) might be what you need. According to Sensible's Roger Tuttleman, Bookends allows you to enter information concerning books or articles into a data base, and to enter an abstract of the book or article at the same time. Later, you can search through the data base for a particular article, using either key words that you've set up when entering the item, the author's name, the title or a part of the title, the publisher, or even part of the abstract. You can then display the item you wanted or print it out.

You can also use the program to print out fully formatted bibliographies and footnotes from the information you've entered in the data base. The program runs on an Apple II Plus or IIe with either 48k or 64k of RAM (you see, you don't need a machine with a lot of memory), and one or two disk drives.

Q: Recently I purchased a Texas Instruments Professional Computer with the MS-DOS operating system. My question is, how close to PC-DOS is the version of MS-DOS I have? What programs written for the IBM Personal Computer can I run on my computer? Is there some way I can tell which programs I can use?

A: According to Sue Metzler of Texas Instruments, you generally can't run programs intended for use on the IBM Personal Computer on your TI Professional. However, for two reasons, that shouldn't be a major problem. First off, most major software vendors have or are coming out with TI versions of their most popular programs for the IBM. Second, the two machines, while not close enough in structure to exchange programs, do create compatible files.

So, if you were to create a spreadsheet on the version of Lotus 1-2-3 written for the TI, and then save your spreadsheet data to disk, the guy at the next desk working on an IBM could boot his Lotus disk and then load your data into his IBM from the disk you created on your TI.

Q: How do I get hooked up with The Source?

A: "We get asked this question so often I wish The Source would give us little handouts to place at the cash register," says Bruce Morrison of Microland Computer in Newark, Calif. Simply call The Source's marketing department at 800-336-3366. They will mail you the latest literature on their phone-in data-base services, including a subscription form.

Q: I have a Hewlett-Packard personal computer at work, and a Digital Equipment Corporation computer at home. How can I make sure the software I buy will work on both computers?

A: When visiting your computer store, tell the salesman that you work on the two different computers. He should be able to direct you to some off-the-shelf software that will work on both.

According to Thomas Wolf, vice-president of Idea Computer in Los Gatos, Calif., "People are becoming more and more software conscious these days. It's more important for software to be transportable. More business people are coming into the store today, so the transportability question becomes quite important."

When the software you want to buy is not compatible with both machines, however, there is still something you can do, Wolf says. By using communications software and a modem, you can get your off-line computer to act as a terminal to the host computer, thus making it possible to have access to the software from both computers.

Q: Why should I buy a computer from one of the smaller companies when I don't even know if they're going to be around tomorrow? And what can I do if I do buy, and then they go under?

A: Those are good questions in light of today's changeable market. Peter Derania, sales manager at Triangle Computer Systems, Inc. in Campbell, Calif., has some valuable suggestions:

First, try and determine a company's viability before you buy. Look at its track record, its installed base of computers, its commitment to the product. Check out the computer's compatibility with the better known computers—that should assure some degree of staying power. While examining these factors alone gives you no guarantee that the company will still be in business a few years from now, it should at least give you enough of an idea to go on.

In answer to your second question: If the company that manufactures your computer goes out of business, user groups are one of the best places to look to for support, Derania says. Find one in your area, and then get involved.

Q: Is there a good reason to buy a monitor that swivels?

A: Yes. The ability to adjust your monitor can be easier not only on your neck muscles, but according to Randy Savoy, general manager of Triangle Computer Systems, Inc. in Campbell, Calif., it can also reduce the glare on your eyes—especially if you sit in an office with a light behind you, where the glare can be harsh.

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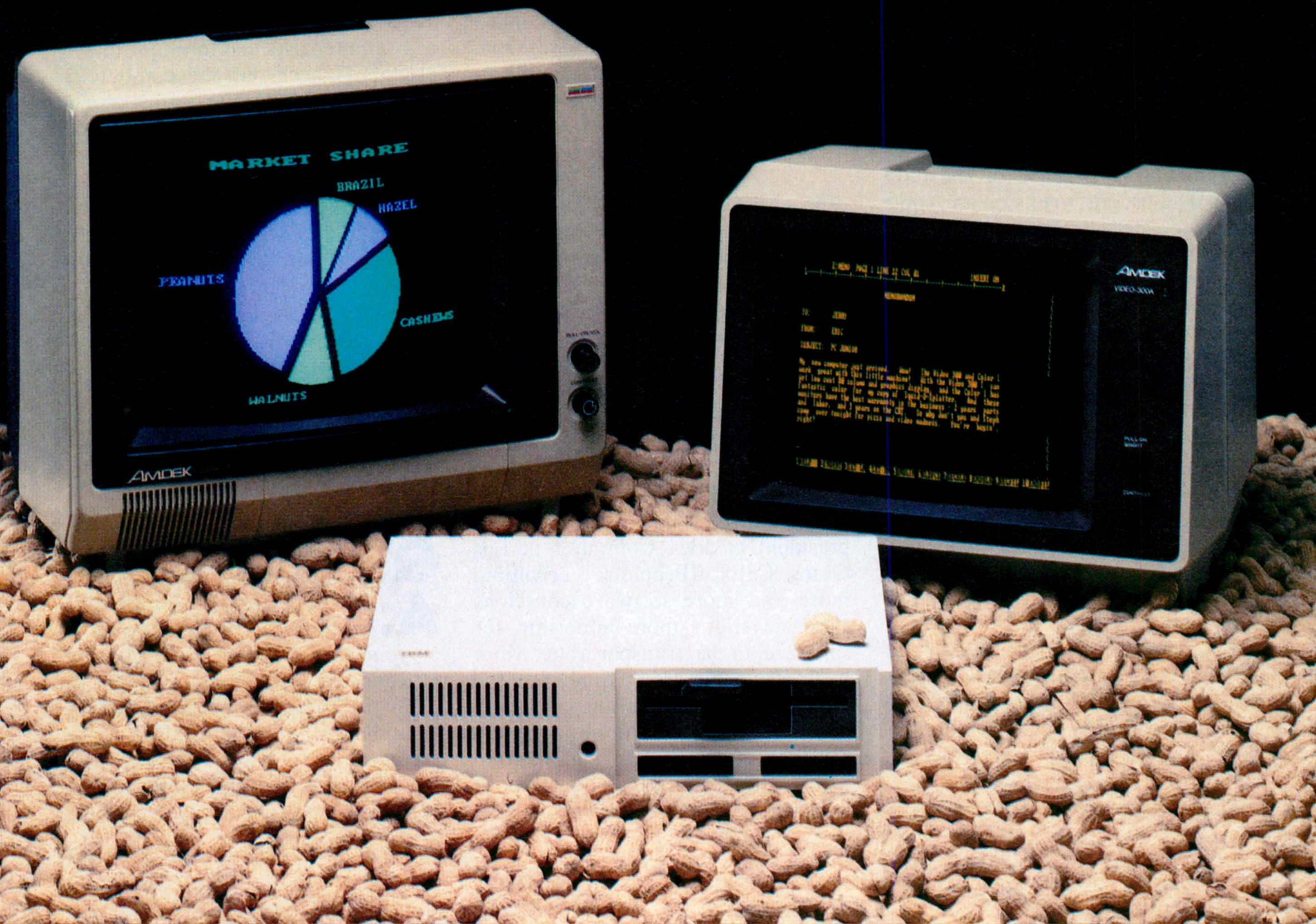
CIRCLE 202



Q: I want to hook up a modem to an RS-232 serial card on my Apple II Plus. A friend told me to be sure the "pinouts" on the modem cable match those on the serial card. What does this mean?

A: The term "pinouts" indicates which pins on the cable interface transmit or receive what data, says Neal Feldman, service technician at Quest Computers in Oakland, Calif. For example, pin 2 on the modem may be the data-into-modem channel, pin 3 may be for sending data out of the modem, and pin 4 might be the request-to-send link between the computer and the modem. Even though the cable from the modem may fit nicely onto the cable from the serial card, the modem won't work properly unless the same information is being sent over the same pin.

The best way to avoid problems is to check the "pinouts" on both the serial card and the modem, and make sure they match before you buy either. This information is provided in the documentation, or you can ask your dealer. Usually it isn't a big problem; a good approach is to select the modem you want for your system, and then call the manufacturer and ask him for a list of serial cards that work with his product.

Q: Do you know how to modify the Apple Writer II word-processing program so printer commands for an Epson FX-80 printer can be executed from within the program? I would like to mix print formats within the body of a letter.

A: We've had several questions on this subject, which is somewhat surprising since the answer appears in the Apple Writer II manual. However, the phrasing by different software and printer manufacturers when referring to printer control codes varies greatly, so that's probably the source of the problem.

In any case, there is no need to modify your program. Instead, you'll find the answer in the Apple Writer II manual under "Inserting Control-Characters in Text" (page 48 of the IIe version).

To insert a control character in a file, all you do is press Control-V. Then every character you enter until you hit Control-V again will be passed as a control character to your printer. For instance, to turn on the Emphasized mode on your Epson printer, you would press Control-V, then the Escape key, then E, and then Control-V again to return to normal text entry. This allows you to mix and match print styles.

Q: If I use my personal computer for home control, does that mean I can't use it for anything else?

A: This is a commonly held misconception about home control, according to Lou Infeld, a project supervisor at Apple Computer who, on his own, is very involved in home-control setups. He says that good-home control hardware and software actually allows you to use the computer for anything you want, when you want, even if the computer is also handling your burglar-alarm system, watering the lawns, turning outside lights on and off, etc.

With most personal computers you do lose the active home-control functioning while you're using the computer for other things; however, when you re-boot the home-control program, the system goes back over the events it's supposed to handle and continues right along, automatically checking over the schedule you saved on disk. Such a program does the same kind of thing when there's a power failure.

For this system to work properly, you need a clock inside your computer, of course. Such clocks are usually battery-powered, so they hum along even when the machine's turned off; then when it goes on again, the program references the clock and compares that against the schedule. So when you finish using the computer for word processing or playing Choplifter, you just re-boot the home-control software disk.

More advanced personal computers will be able to run home-control functions "in background" while you use other applications programs in foreground. But background/foreground operation requires large amounts of memory, powerful processors, sophisticated operating system software—in fact, it may turn out to be cheaper to just have two personal computers of more usual capabilities than one of these expensive powerhouses. Furthermore, implementing software is not common for such things yet—though we can expect to see such things in one or two years.

Q: I am looking for a company that will sell me a dictionary of about 50,000 words on a disk. I've written a few companies that advertise proofreaders, but their dictionaries can be accessed only by their software. I need a dictionary that I can access with a program of my own. Any suggestions?

A: If you are a program author, there may be a way. Proximity Software in Fort Lauderdale, Fla., is a large supplier of dictionary programs. These dictionaries are not tied to Proximity's software, but are exclusively licensed to software publishers for use with the software they have developed. Proximity develops the word lists in conjunction with Miriam-Webster, the book dictionary publisher.

As an end-user of software, you have a problem. Software publishers won't put a word list on a disk because they fear a loss of value once the list is released. This is why word lists are often tied to the company's software—to prevent uncontrolled proliferation of the list.

(continued on page 173)

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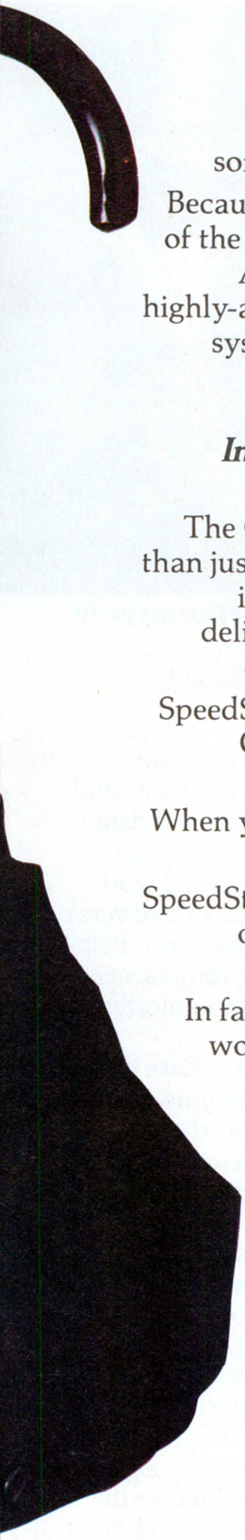

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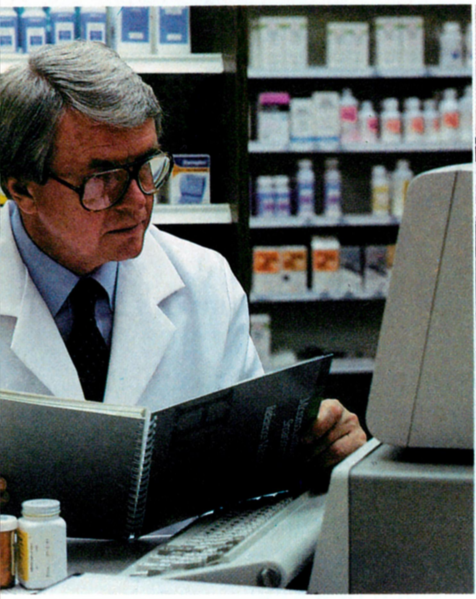

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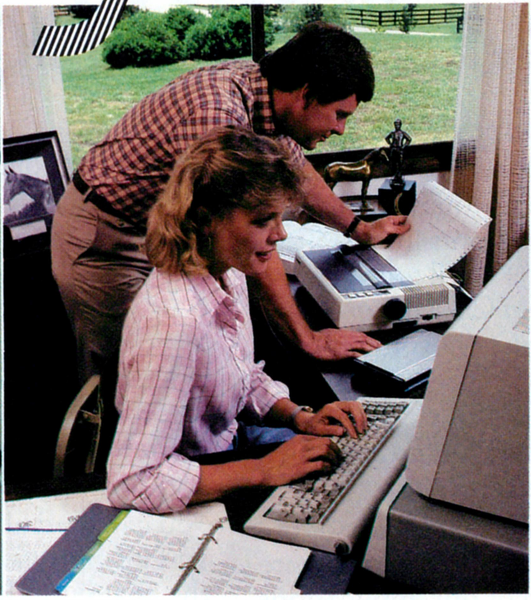

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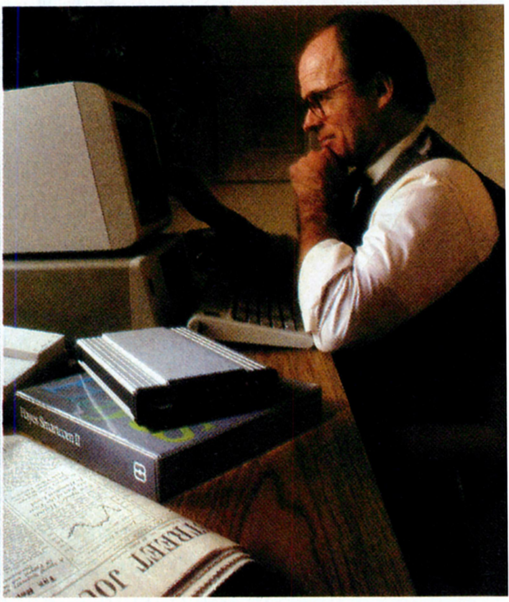

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With Smartcom II, it is. Case in point: Before you communicate with another system, you need to "set up" your computer to match the way the remote system transmits data. With Smartcom II, you do this only once. After that, parameters for 25 different remote systems are stored in a directory on Smartcom II.

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Smartmodem 300, 1200 and 1200B are FCC approved in the U.S. and DOC approved in Canada. All require an IBM PC with minimum 96K bytes of memory; IBM DOS 1.10 or 1.00; one disk drive; and 80-column display.

Smartmodem 1200B. (Includes telephone cable. No serial card or separate power source is needed.)

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Smartcom II communications software.

NOTE: Smartmodem 1200B may also be installed in the IBM Personal Computer XT or the Expansion Unit.
In those units, another board installed in the slot to the immediate right of the Smartmodem 1200B may not clear the modem; also, the brackets may not fit properly. If this occurs, the slot to the right of the modem should be left empty.

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(continued from page 169)

Proximity doesn't sell word lists to end-users, but will license them to authors who need word lists for their programs. The company doesn't focus on any particular system, but its programs are written in C, and the code will run on most machines.

For an end-user, Proximity recommends contact with a university's computer science department, which may turn up a public domain list.

Q: Which kind of printer should I buy—dot-matrix or letter quality?

A: Your answer probably lies in how much money you have in the bank, says Kyung Yi, consulting manager of A & K Computers in San Jose, Calif. If you have plenty to spend, buy the letter quality, which gives you a sharper print quality, similar to a typewriter's image. If you're watching your wallet a little more closely, you may want to opt for the less expensive dot-matrix printers. There are some fine ones available now which are very near letter quality and cost only $500.

A couple more considerations to think of, Yi notes: If you're planning to print out legal documents or something of the like, you should probably use letter quality, simply because it looks more professional. We've even heard that some graduate school committees won't accept a thesis that's done with a dot-matrix printer, even if it is near letter quality.

Finally, remember that a dot-matrix printer will generally print out faster than a letter quality. That's something to think about if you plan to be printing a lot.

Q: I have a computer at my office and one at home, but they're not compatible. Is there an easy way to transfer data between them?

A: The easiest way, says Norman Smith of the Micro Age computer store in Pleasant Hill, Calif., is to do a little primitive networking. "A lot of people with a compatibility problem between home and office computers are using information utilities, like The Source, as a bridge. They buy modems for both computers, and then when they leave the office, they store the data they want to 'take home' in their Source mailbox. When they get home, they can call The Source with their other computer and pick the data up."

Smith notes that data transfer is easiest if similar programs are being run in both places—VisiCalc on both computers, for example, if it's numerical data, or WordStar if it's text. Anyway, it's a lot cheaper to subscribe to The Source and buy a couple of modems than it is to get another computer that's compatible.

Q: I'm a frequent air traveler, and I've purchased a Model 100 personal computer from Radio Shack. I'd like to use the computer while I'm on the plane. Is this legal?

A: It's OK, and then it's not OK, depending on which airline you use. Vincent Modugno of American Airlines reports that personal computers that can't be held in your hand can't be used by passengers aboard American Airlines.

As for your Model 100, which can technically be held in your hand, sorry, says Modugno. Lap-size computers like the Model 100 are out! Hand-held computers, as Modugno refers to them, are pocket computers that look more like calculators.

Another "not allowed" on American Airlines is the use of any computer that can print. This eliminates a pocket computer when using a printer interface.

However, David Venz of TWA states that his company has no reason to prevent the use of personal computers aboard TWA flights.

Obviously, each airline has its own

(continued on page 177)

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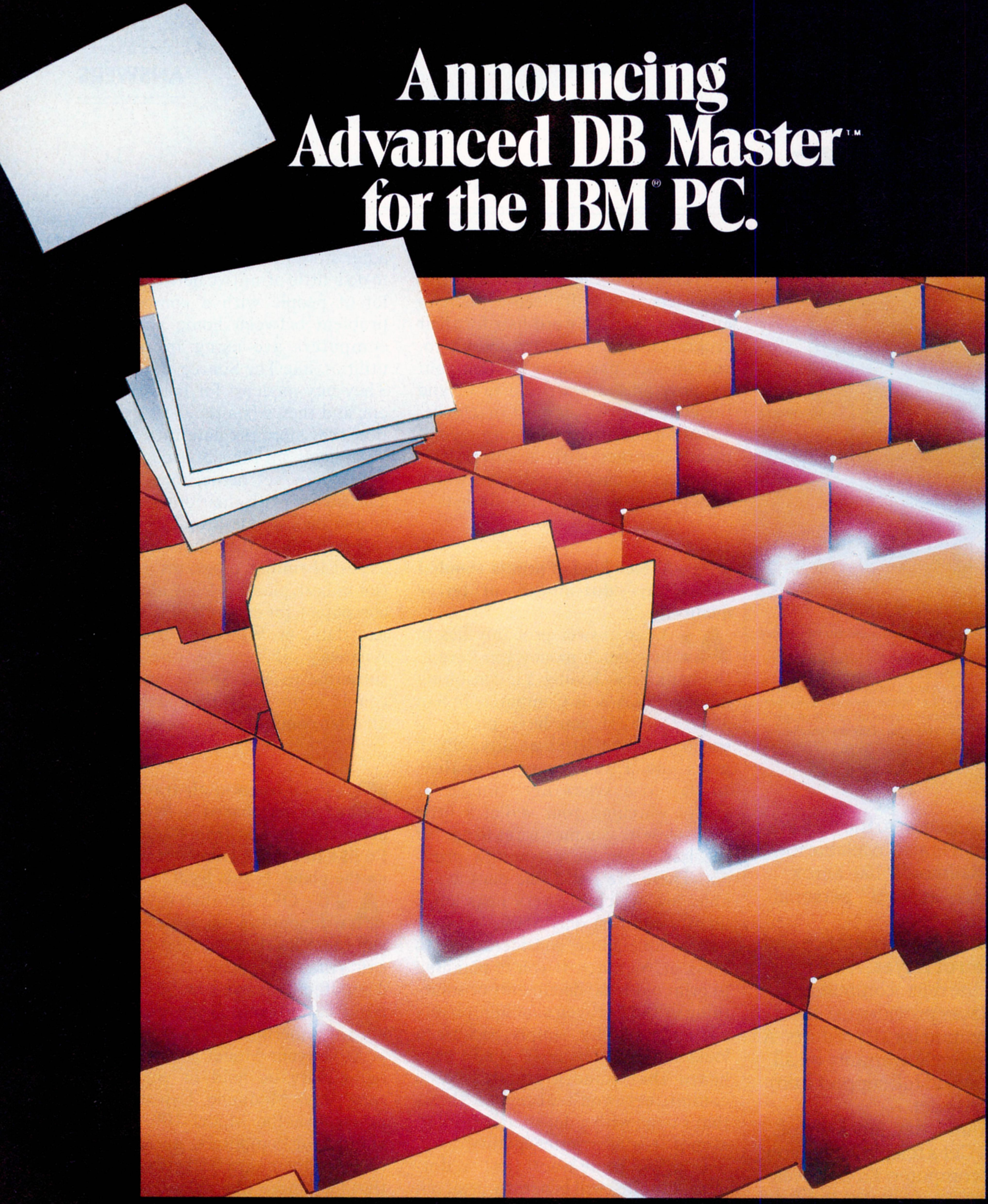

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CIRCLE 89

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CIRCLE 96

(continued from page 173)

rules about the types of personal computers that can or can't be used on its aircraft. The main concern of the airlines is over the potential interference with electronic equipment aboard the aircraft generated by signals produced by computers.

Q: I recently purchased a joystick that set me back almost $100. When I got home and tried to install it, a pin on the end of the cable broke off. Now the joystick is useless. Is there any way this can be repaired or do I have to toss it in the junk pile and buy a new one?

A: Pins on computer chips and cables are fragile and even computer service technicians find themselves accidentally snapping a pin during installation. As for repairing your joystick, the answer is yes and no. According to Jim Rembis of ComputerLand in Niles, Ill., it is more economical to purchase a new joystick than to have your local computer store repair it, if your joystick has a rounded cable. The cable will cost around $14 and you'll be paying an hourly rate of around $40 to $45 for the service technician to install the cable. Since the technician will have to solder the new cable into position, the repair could run close to an hour, which will bring your total repair bill very close to the price of a new joystick.

On the other hand, if your joystick has a flat cable instead of a round one, your local service center can probably repair the joystick in under an hour, making the repair less expensive than buying a new joystick. If you're handy with a soldering iron and have the time to tackle the job yourself, you could purchase a new joystick cable and install it, for a total cost of $14, well under the $65 to $100 that you'll pay for a new joystick.

The choice is yours, of course, but whatever your decision, here are a few hints to keep in mind when you're installing the joystick or any computer chip: Before you push the cable pins into the socket, check that the pins are straight. If they're not, you'll have to take the risk of breaking them

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off and trying to straighten them. When you're ready to insert the pins in the socket, make sure each pin is centered over the holes in the socket. Then carefully push the pin into position. If the connection doesn't insert smoothly—stop! Recheck the position of the pins. These steps should help you to reduce the chances of breaking a pin during the installation of your joystick.

Q: I haven't purchased a personal computer yet and I'm wondering which size disk drive is best for me—8″ or 5¼″?

A: Well, the best disk drive for you will depend upon the applications you have in mind. Shirley Crawford of the Radio Shack Computer Center in Louisville, Ky., reports that the 8″ disk drive is designed for larger business applications where you have to store more programs and data files, such as accounts receivable or payroll.

If a business has between 300 and 800 accounts for a single application, the 8″ drives are ideal. Although the 5¼″ disk drives could handle the job, more disks are necessary to store account information, and multiple disks for a single application can be cumbersome for the operator.

For applications that require more than 800 files for a single run, a hard disk system is the ideal hardware to use. This system will give the operator greater capacity to store files and a faster access time when recovering data in those files.

Which one is for you? More information is necessary about your application before we can give a recommendation, but you should be able to decide for yourself if you determine the number of files you'll be using for any single application.

Q: Why do I need a second disk drive for my computer?

A: Some business software requires a second drive, according to Sal Alonso of Microland Computers in Newark, Calif. It is possible to use some business packages with one drive, but often their more advanced features make a second disk

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CIRCLE 150

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CIRCLE 221

drive essential. For example, you need two drives to work with DIF files in VisiCalc. The choice of a second drive goes beyond mere need, though. Once you've experienced the convenience of doubled storage capacity and of not having to switch continually from program disk to data disk, you'll wonder how you ever got along with just a single drive.

Q: What kinds of display devices can I buy for my personal computer?

A: You have four types of displays to choose from, according to Bob Getsla, station engineer, and Barbara Hansen, learning services coordinator, of public television station KTEH in San Jose, California. They've been deeply involved in implementing computer use at their station, and make heavy use of display devices on a regular basis. These devices are the computer monitor, the video monitor, the TV receiver/monitor, and the TV receiver.

First, the computer monitor: Producing a high-resolution image, it's specifically designed for use with a computer. It has only a video input terminal through which a microcomputer signal passes, so a monitor can only receive a video signal from a computer—not from a TV station. You can buy monitors with features like anti-glare screens. Monitors come in color or monochrome designs, including amber- and green-screen versions.

Next is the video monitor. Designed primarily for use in television production to view the image coming out of a camera or video recorder, it has only a video input terminal. It has no tuner, RF input terminal, or loudspeaker. A video monitor produces a high-resolution color or black and white picture (not amber or green), but is very expensive. There are interfaces available to make it possible to store computer data on videotape, such as the Mirror from Corvus of San Jose, California.

Then there's the receiver/monitor. It has a video input terminal enabling it to function like a video monitor in conjunction with a video camera

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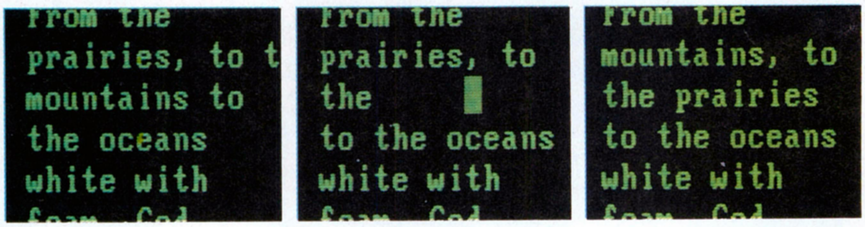

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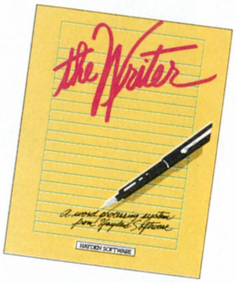

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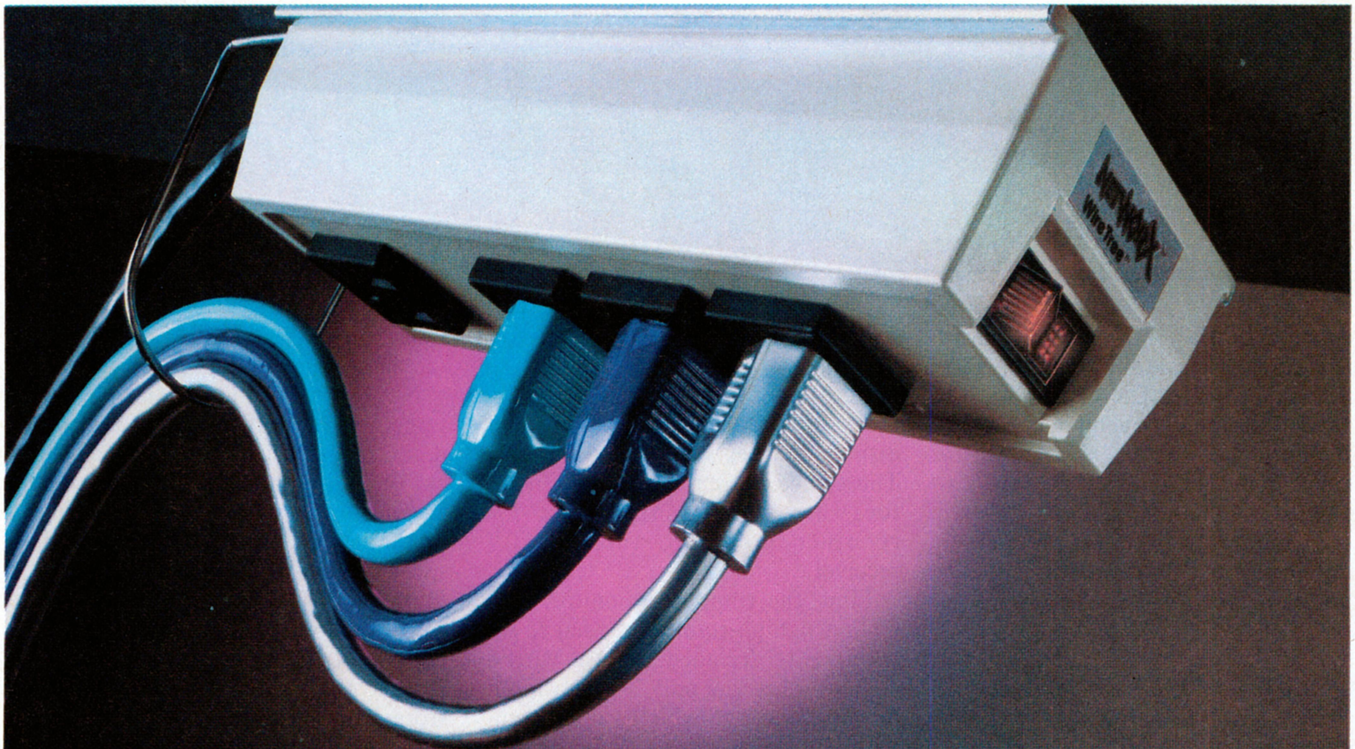
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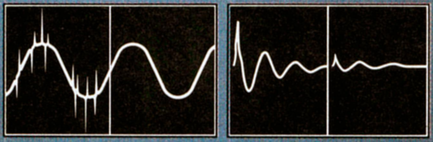

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CIRCLE 35

and/or recorder, and it has a tuner so you can select TV channels. It has an RF input terminal enabling it to receive TV signals, along with a loudspeaker. It may be color or black and white, but not amber or green. It has video and audio output terminals. If connected to a video recorder, this would permit recording TV programs on a videotape machine that lacks a good tuner. Most of RCA's new TV line will be set up this way.

Last, we have the conventional TV receiver, which is designed to receive only TV signals. You must use an RF modulator (usually a separate purchase) to use a TV set with a computer. It can be black and white (not amber or green), or color.

Q: How much do I have to worry about compatibility in choosing a printer for my computer?

A: Most printers are compatible with most computers, says Brad Roth of Infomax Computers in Walnut Creek, Calif., but the printer will have to be configured to work with a specific computer. Cable connections differ, and DIP switches inside the printer will have to be set so that the printer knows what kinds of signals to expect from the computer and software.

Some word-processing programs, for example, tell the printer to advance one line after each carriage return, while other programs don't. The printer's DIP switches can be changed to allow for either case.

Roth recommends that you try to buy the printer and computer from the same dealer, because then the dealer will probably configure the printer for you.

Q: Why can't I get 80 columns of text on my television set?

A: Television sets and inexpensive color monitors cannot support 80 columns because they are only "medium-resolution" monitors,

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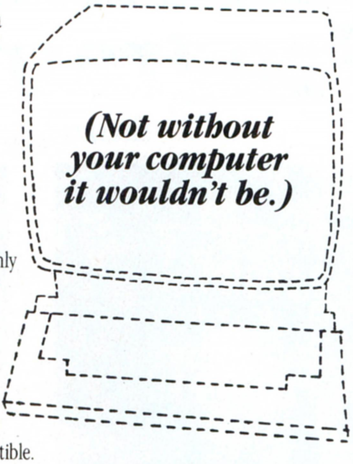
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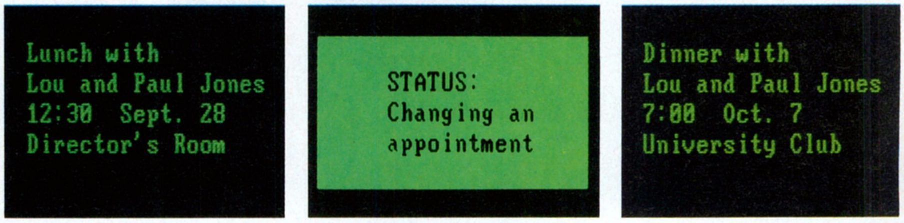

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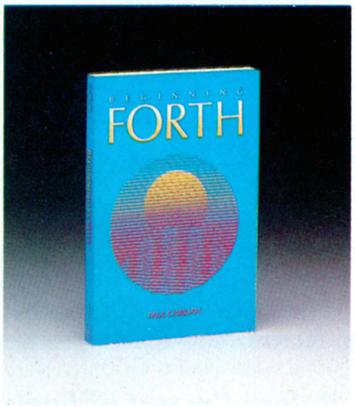
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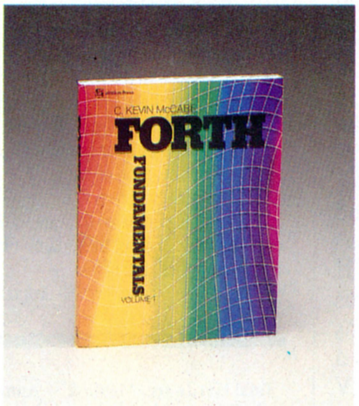
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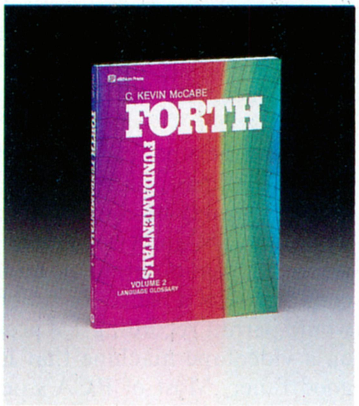
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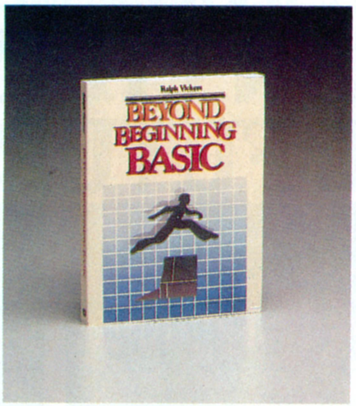
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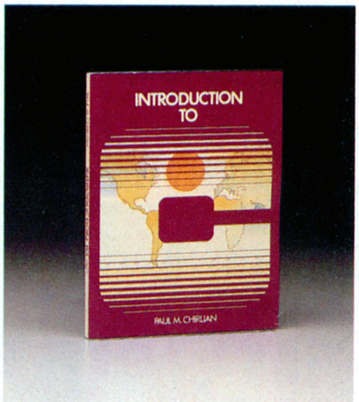
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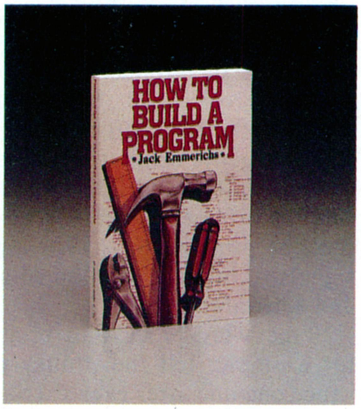
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CIRCLE 197

says Lewis Watmore, assistant technical support representative at Computer Center Stores in San Jose, Calif. Let's take a second to explore exactly what resolution is.

Each dot which lights up on the screen is called a pixel, short for picture element. The more dots per square inch, the higher the resolution, and the clearer, sharper picture you will get.

You will need a monochrome, high-resolution monitor to be able to use 80 columns and have it be readable. You could technically *get* 80 columns on a TV set, but it would be blurry and indecipherable. To successfully use 80 columns, you need both a high-resolution monitor and a plug-in card. Those are the breaks.

Q: How long will it take to transfer from my present manual system of accounting to a computertized accounting system?

A: John Weingarten of Mission Computer Centers of Northern California says that some salespeople, in an attempt to make the transition seem less overwhelming, suggest a one- or two-month transition period, but advice from accountants has lead him to encourage his customers to keep their manual system going along with their new computerized system for three to six months.

Problems with a computerized accounting system often don't show up until you run quarterly reports, and if you have already disposed of your manual system, straightening things out can be a nightmare. The accuracy of financial records is critical to any business. Rushing into full computerization isn't worth the small savings of time, considering the large risk involved.

Computerizing your accounting can be a big step toward better graphs on your company's financial condition, but it's wise to take the step cautiously.

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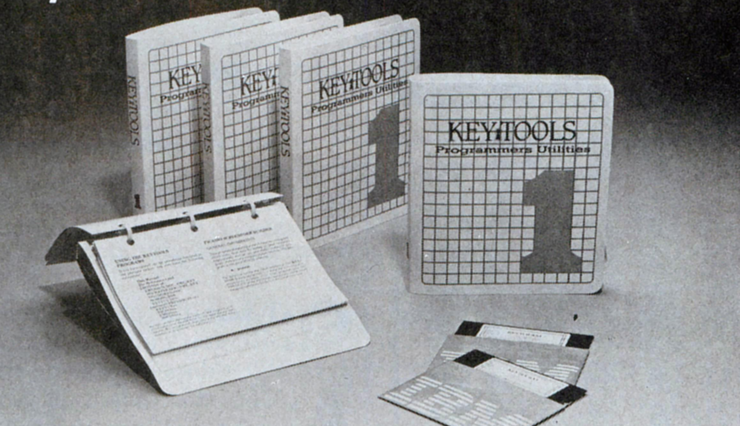

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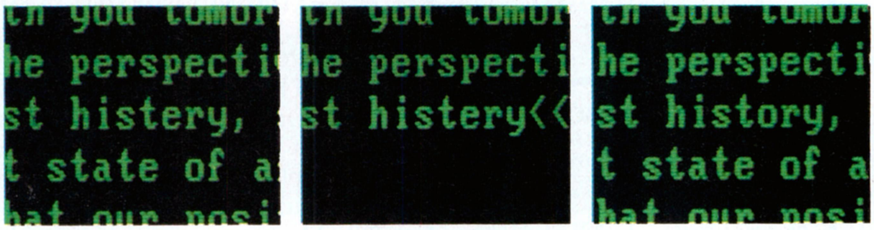

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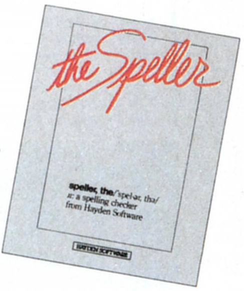
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CIRCLE 72

ANSWERS

Q: I hear the phrase "computer literacy" all the time these days. What does it really mean?

A: Computer literacy has come to mean different things to different people. In a recent report, The Academic Council Committee on Computers and Information Technology of Stanford University cites three main criteria for computer literacy. The report says that competence includes: 1) some facility with at least one text editor, computer, and operating system; 2) the ability to write and debug a program successfully; and 3) the ability to design, implement, debug, and maintain reliable algorithms, perhaps even efficient ones, in the service of serious professional goals.

According to the report, minimum competence for undergraduates would require "at least a cursory knowledge" of these three elements, while "professional competence requires substantial mastery."

Q: I currently have IBM PC-DOS 1.1 and am thinking of upgrading to PC-DOS 2.0. Should I?

A: The first consideration, says Dan Firebaugh of ComputerLand of Central Georgia, is whether the application packages you currently use will be compatible with 2.0. Most software publishers have done the necessary conversion by now, but if you purchased your software some time ago it may not work.

The dealer from whom you purchased the software can tell you if the package will run on PC-DOS 2.0, or, if not, what the policy of the software publisher is on upgrading your software so that it will run.

The chief enhancements found in PC-DOS 2.0, by the way, do not have much utility on floppy-based Personal Computers. PC-DOS 2.0's tree structured directory, for example, is very useful for dividing the 10 MBytes of storage space provided by the IBM expansion chassis and hard disk into logical subgroupings of more manageable size. But there would be less need to perform such a division on a floppy disk, obviously.

Of the 25 new commands and 12 enhancements to old commands that you'll get with PC-DOS 2.0, most are for use with hard disk—such as backup and restore—or to make the lives of software developers easier. The only true advantage for the typical owner of a floppy-based Personal Computer is an extra disk sector, which provides an extra 20k of storage per side.

Q: I own an Osborne 1 computer. How can I get it serviced, now that the company has filed for bankruptcy?

A: Fortunately, Osborne signed an agreement with Xerox Service Group to service and repair its Osborne 1 and Executive computers. The agreement allows Xerox to sell one- or two-year service contracts to users through local dealers or directly from a Xerox Service Center. Warranties purchased previously from Osborne Computer Corporation are not covered under the agreement.

According to Mike Bruni of the Xerox Service Center in Sunnyvale, Calif., Xerox will only repair machines covered under their contracts or purchased new from a Xerox Store. If your disk drive wears out, they will not repair it without a paid contract. This may change in the future. Bruni says Xerox is also working with a number of third-party independent dealers to provide parts and repairs. Check with your dealer to see if he repairs Osbornes in his store. If not, you can contact any Xerox Service Center or Xerox Store for the location nearest you.

In addition to purchasing 20 percent of Osborne's parts inventory, Xerox also obtained the company's customer mailing list. Osborne owners should be receiving additional information in the mail from Xerox.

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CIRCLE 196

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ComputerLand also has a special agreement with Xerox to provide service to Osborne owners, according to Gary Gapp, vice-president of operations for ComputerLand USA. If your dealer is a ComputerLand franchise, he may provide Osborne service at his store, or he can refer you to a Xerox repair center. "We've also worked out some contracts with some of Osborne's parts vendors, so our stores can buy certain parts to facilitate repair of the Osbornes," Gapp adds.

Q: In my basic computer class, I was told I have to have a 16-bit computer, even though my primary use for a computer will be educational programs, simple home accounting, and games. Is this necessary?

A: No. Manufacturers of 16-bit systems naturally are trying to get everyone to think they'll be living in the dark ages if they buy an 8-bit computer, but at this point there's a lot more promise in 16-bit computers than there are actual advantages, particularly for individual applications, says Russ Bacon, sales manager of ComputerLand in Walnut Creek, California.

The main advantage to 16-bit computers is their ability to address much more active memory, or RAM. The reason this isn't such a big deal right now is that the vast majority of programs available require only 64k of RAM or less to run, including popular packages like dBASE II and WordStar. This is because most programs are still written in BASIC, and you can't address more than 64k of memory with BASIC.

For your applications, a much more important criterion in selecting a computer is the amount of disk storage space you will be getting. You pay the same amount of money for blank data disks whether your computer will store 80k on a disk or 200k, so low-volume disk drives will end up costing you more, and you'll be swapping disks more frequently. Bacon recommends a minimum of 160k of disk storage for his customers.

Q: Would it be good preventive maintenance to buy a fan for my computer?

A: Kevin Terrill, service manager of the Santa Clara, Calif., Computer Repair Center, advocates fanless operation whenever possible. He says you only need a fan if the surrounding area is constantly above 85 to 90 degrees Fahrenheit, or if the machine is extremely compact and relatively unventilated (in which case it will usually come with a built-in fan). But generally, Terrill believes it's probably a better idea not to use a fan.

Terrill says most integrated circuits are burned-in at from 130 to 150 degrees Fahrenheit when they're new, in fact. And the thing that damages IC's the most is temperature fluctuation, not heat. The second main source of IC problems is when they come loose from their sockets. And guess what works them loose? Fan vibration does, says Terrill. Add-on fans are not vibration-isolated, and neither are many built-in fans. "If you're adding a fan you will add internal vibration, which will cause chips to work up from their sockets."

One of Terrill's service contracts includes maintenance of numerous—and various—computers for a local school district, and he says one of the most common ways he fixes malfunctioning computers is to turn them off and systematically push all the IC's firmly down into their sockets, both on the computer's motherboard and on any accessory boards as well. Even with fanless computers, the aggregate vibrations of years of use can still work chips loose, he says.

Terrill says you don't need to add a fan to your computer unless "you have more than one or two chips fail over the course of a year. That

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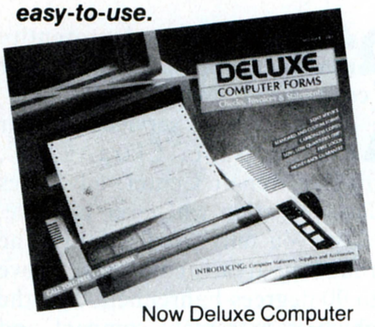

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usually indicates a heat-related problem. If you never have chip failures, then forget about a fan." He services at least eight to 10 "stuffed" Apple II Plus computers in the school district—Apples with every accessory slot filled with additional PC boards—and there's not a fan among them. They may wear out their power supplies on occasion, but that's not from heat—it's from heavy power draw, a separate issue.

According to Terrill, fan vibrations can break chips internally as well as working them loose from their sockets. "The heat of fanless operation is less likely to set up a frequency that breaks the die bonds inside the chips than fan vibration would. It's best to keep the computer running at a constant temperature by leaving it running all the time. That's how I run mine," he says.

Where you do have to use a fan for cooling, Terrill recommends a periodic "chip massage" as good preventive maintenance, and as something to do before you call the repairman.

Q: Which part of my computer system is the most likely problem source?

A: According to Mark Clausen, computer marketing representative at Radio Shack in Vallejo, Calif., the most likely problem area is your disk drive system. Just like the mechanical parts of a car, the mechanical parts of a computer need to be serviced.

Other trouble areas could be your printer, or even your keyboard. What sometimes seem to be electrical problems often turn out to be mechanical—a printer isn't working consistently because the cable is loose, or a flicker in the video display turns out to be caused by a loose chip in the circuit board.

By and large, the solid-state parts of the computer (the circuitry and the monitor) are extremely reliable.

Q: Can my Apple IIe really take the strain of running 24 hours a day for home control applications, or should I look for a more "industrial strength" computer?

A: Your Apple should do fine, but it is true that some computers can't take constant operation, according to Lou Infeld, a project supervisor at Apple Computer who designed a home control setup for his own home and is now selling it through a company his brother runs. A small personal computer that comes in a virtually sealed box will eventually overheat in warm, still-air conditions.

While the integrated circuits (IC) comprising a computer's "heart" are extremely reliable, they can't take overheating. When they do overheat, they keel over. That's because an IC has hundreds, often thousands, of electronic components all jammed together inside a fingernail-sized chip of silicon. If one of those thousands of microscopic components inside the chip fails, the chip has to be discarded.

According to Infeld, if a computer feels hot after long operation, you could be in for trouble. But even then, most computers are designed to prevent actual chip failure. Instead, the power supply (which converts line current to the low voltages used by the chips) kicks out and the machine just won't operate until it cools off.

Many computers have fans to combat overheating, but properly vented units with a heat-sink, like the Apple III, will do just as well without a fan, says Infeld. The Apple II was a machine noted for needing a fan if more than a few accessory boards were mounted inside, but the new Apple IIe was redesigned to contain far fewer chips than its predecessor. Consequently, this machine runs cooler.

Just make sure your computer is properly vented. Remember: Warm air rises, and if it has a way to rise up from the rows of vents along either

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side of the IIe's case—and if you don't have every add-in slot inside the case filled with accessory boards—the IIe will run indefinitely, even without a fan.

Q: What sort of home-control functions are people doing with personal computers?

A: In a typical home application, the computer runs 24 hours per day, seven days per week, says Lou Infeld, a project supervisor at Apple Computer. He says Apples are often used in home-control situations because they're relatively cheap as expandable computers go—you need to be able to install a peripheral like the BSR "black box" that turns your computer's commands into actual signals that can turn home functions on and off.

With a clock card installed, such a setup can: calculate time of sunrise and sunset for each successive day at any particular latitude and longitude, along with factoring in daylight savings, and turn lights on and off on both a timed and individualized basis—living room, bathroom, walkway, etc., including cyclic events like having certain lights turn on and off periodically; you can set a bedside control to turn on all the lights if you hear a noise, with the computer automatically shutting them off in, say, 15 minutes if you don't intervene; you can control lighting rheostats to dim and brighten lights as well as turn them off and on; you can have the computer chime the hours and half hours like a cuckoo clock; you can control a burglar-alarm system, even including phoning the police department and delivering a message in synthesized speech or turning on a taped message; you can run several sets of sprinklers on a separate basis, complete with seasonal variations—and with an advanced system to take feedback from temperature and humidity sensors, you could even program it to take rainfall into account; you can control heating systems and air conditioners, allowing you to use inexpensive, simple thermostats—sometimes in pairs (for day and evening settings), instead of buying more expensive "intelligent" thermostats;

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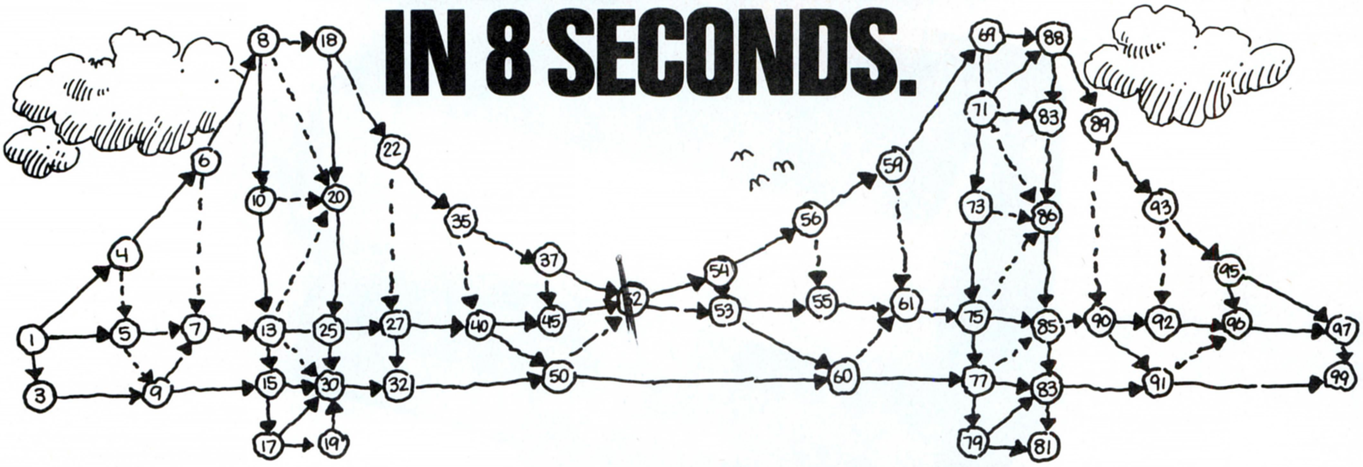

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you can control a solar panel heating system, too, though that's another operation that may require additional programming; you can set the automatic garage door opener to turn off when everyone's asleep or away, to prevent unauthorized entry.

Basically, you can control just about anything that electricity can actuate. If you just want to time things to go on and off, you can get by with the applications programs available for home control, such as Home Controller for the Apple II by Infeld Software, 2422 Albin St., Suite 100, Mountain View, CA 94043. For systems reacting to changes in the environment you'd need something like Advanced Home Control. This will accept program modules written in Pascal that allow for such functions. The programs cost $40 and $55 respectively. The latter needs a 64k Apple, while the former works with just 48k. Both need some kind of clock card like the Prometheus Products Versacard. The Versacard and the BSR controller cost around $250. For a feedback setup to work you need additional hardware in the form of transducers—devices which translate various events (like heat changes or loud noises) into electrical currents the computer can "understand."

People who want to embark on projects like this may find it worthwhile to join a local computer club, where enthusiastic members can provide and problem-solving support.

Q: How important is electrical grounding with computing gear?

A: Kevin Terrill, service manager of Computer Repair Center, Santa Clara, Calif., believes all computing gear should be grounded with three-prong plugs, used with properly grounded outlets, by the way. It does no good to have a three-prong plug if it's plugged to an ungrounded wall socket with a three-prong adaptor, unless the protruding tab on the adaptor is wired to some kind of ground. Some computer peripherals—like monitors—may not have a three-prong plug. Terrill recommends attaching a wire to such a device's frame (this requires a metal-

(continued on page 196)

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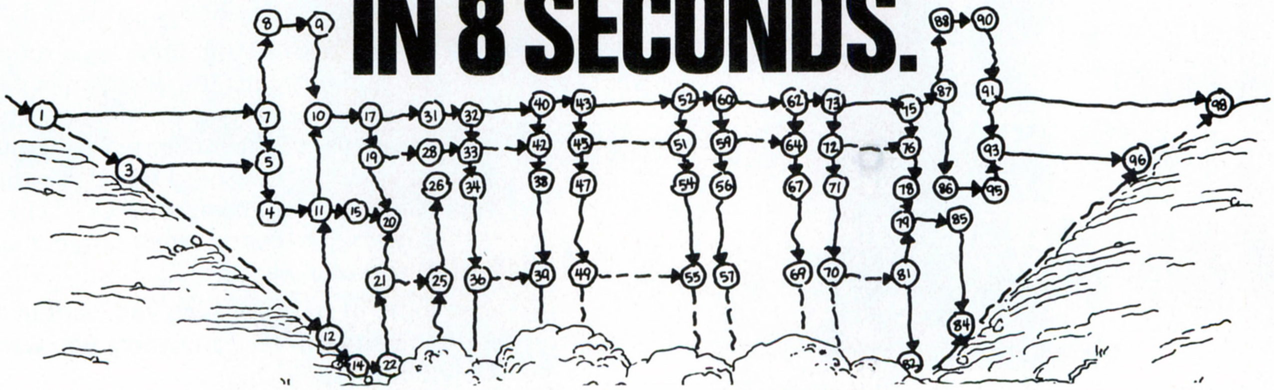

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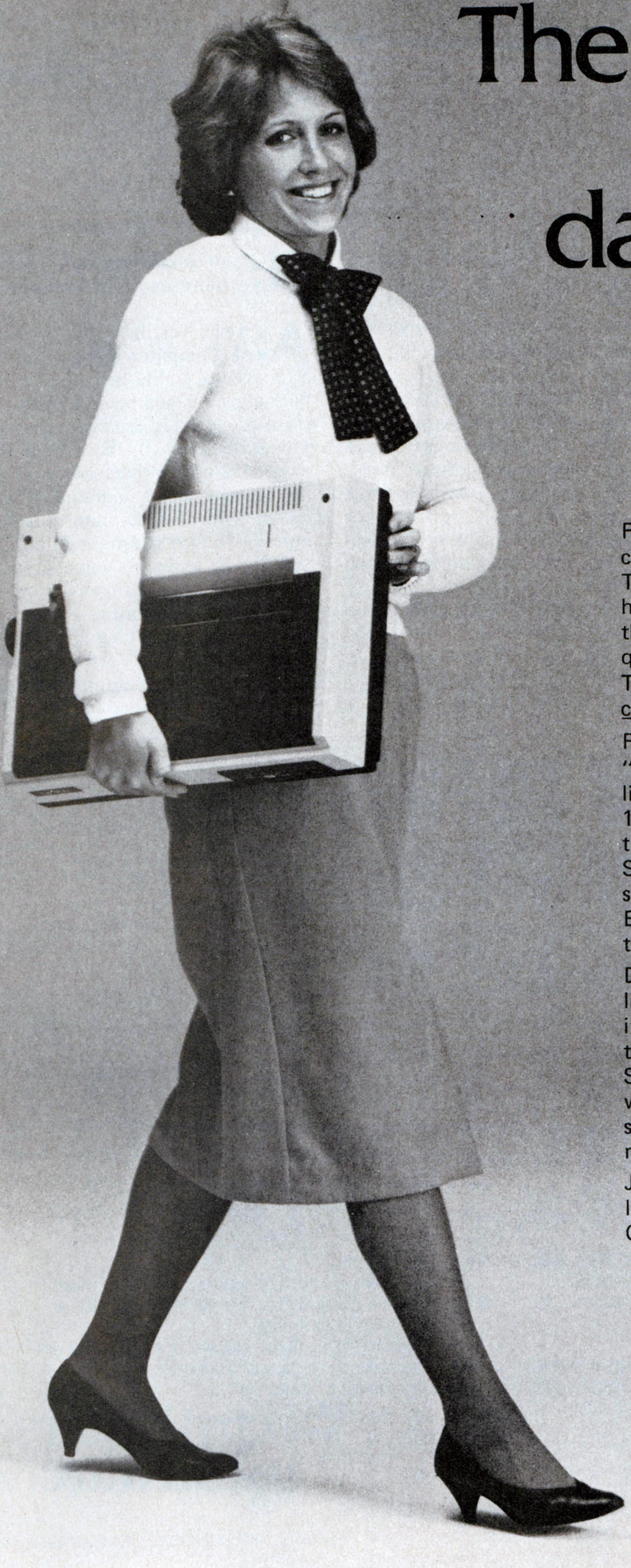

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CIRCLE 92

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CIRCLE 220

(continued from page 193)

to-metal connection), and then running the wire to a ground, such as a water pipe.

Terrill says one precaution people take to be safe—unplugging a computer when plugging in or unplugging a peripheral device or PC board—actually achieves the opposite effect. He says proper procedure is to keep the machine plugged into the wall to maintain grounding, but have the computer turned off. He adds that line conditioners or isolation transformers further protect the computer, in areas where such line current shows surges and spikes. Computers tend to have internal protection against surges, but if you've experienced intermittent data losses that couldn't be traced to defects or breakdowns in your hardware, that could be the cause.

Q: I'm interested in buying a portable computer with a built-in hard disk, but I'm worried about the sturdiness of the hard disk when I move the computer around.

A: There are a couple of things to look for in the specifications of hard disk portable computers, as far as sturdiness goes, according to Russ Bacon, sales manager of ComputerLand in Walnut Creek, California. First, the hard disk should have a lock-down routine for the head. This is a software-controlled function that moves the disk's read/write head to an unused portion of the disk and keeps it there until the unit is reactivated. This will prevent the head from coming into contact with the disk in an area where data is stored.

The other feature you should check is whether or not the hard disk unit is shock-mounted inside the computer. Some computers have rubber mounts surrounding the hard disk unit, to keep it from slamming against the inside of the computer in transit. A normal hard disk unit that isn't shock protected, for example, can be damaged if you drop it as little as 3″. The gravitational force, or g-force involved in a 3″ drop isn't very high—it's less than the force generated if you bumped your portable moderately against a table or doorway. The hard disk unit should be protected to handle the kinds of g-forces encountered in picking up, setting down, and otherwise moving a portable around.

Q: Where can I find help to learn how to take full advantage of dBASE II?

A: SoftwareBanc Seminars of Arlington, Mass., offers in-depth classes on dBASE II in major cities all over the country. Courses are targeted to both beginners and advanced dBASE users.

Classes are taught in a lecture format, and the fee for each eight-hour day of instruction is $175. The first day's seminar concentrates on the basics, helping to get the participants comfortable with the complex data-base manager. The second seminar teaches the braver students how to program with dBASE II.

Adam Green, SoftwareBanc founder, is also the author of the popular dBASE II User's Guide. Write to SoftwareBanc, 661 Massachusetts Ave., Arlington, MA 02174 for the 1984 seminar schedule.

Another source of assistance is *dNEWS*, a monthly publication devoted to dBASE II applications, published by Ashton-Tate. According to Russ Phelps, a customer service representative with Ashton-Tate, *dNEWS* features articles written by people inside the company with different areas of expertise. "We also feature articles written by outsiders on various aspects of dBASE, such as writing a Command file," says Phelps. "We solicit articles from people on various applications that they've developed."

Phelps says *dNEWS* also includes a monthly column called Technical Hotline. Subscriptions are $18 a year. Write to Ashton-Tate, Inc., c/o *dNEWS*, Subscription Service, 10150 West Jefferson Blvd., Culver City, CA 90230.

Q: Is there any way I can beef up my Radio Shack Model I to bring it up to date with a Model III or Model 4?

A: Errol Cummings from the Radio Shack Computer Center in Indianapolis, Ind., states that you can increase the capacity of your Model I, but there are limitations. You can purchase an expansion interface for the Model I and additional memory to bring it up to 48k of RAM (you can't go beyond this, for technical reasons) which makes it equal to the Model III. The Model 4, on the other hand, holds 64k of RAM, which is beyond the reach of your Model I.

Remember, we're talking about capacity equal to the Model III—not identical. There is a difference when it comes to running software. Not all software designed for the Model III and Model 4 will operate on a beefed-up Model I. It just doesn't work like that. You should be able to find software that has both a Model I and a Model III version.

Now for some bad news. Although you can technically increase the capabilities of your Model I personal computer, you'll have to hunt for the parts. The Model I is a first generation computer for the home produced by Radio Shack, and the company is now in the third generation of this same line.

Before you bring your Model I in for upgrading, check into the economics. Compare the cost of upgrading with the revenue you could receive from selling your Model I and buying a Model III or Model 4. You may find, like other Model I owners have, that selling your old computer and buying a new one is the most economical approach.

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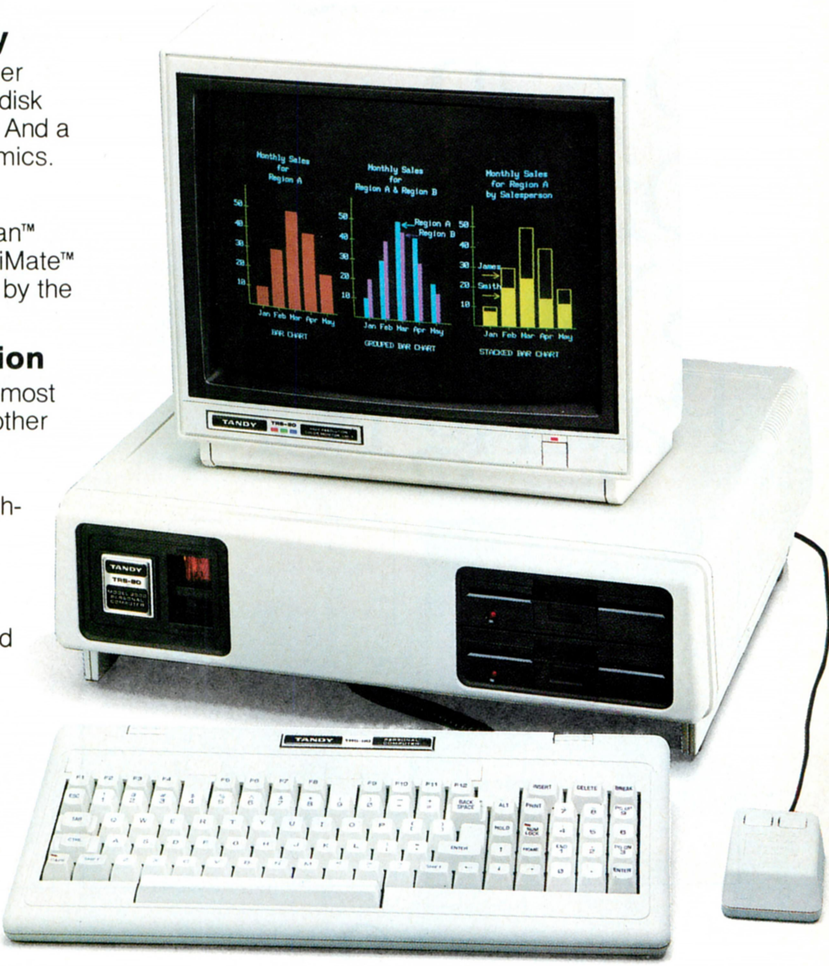
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Total Cost*	$2999	$3658
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Disk Capacity Per Drive	720K	160K or 320K (optional)
Microprocessor Clock Speed	8 MHz	4.7 MHz
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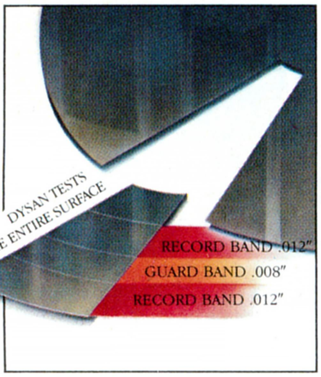
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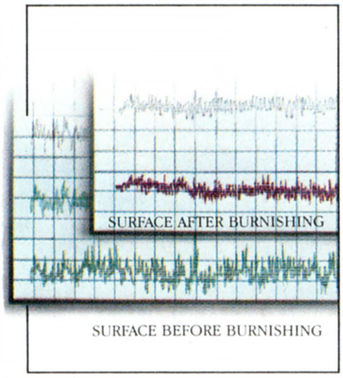

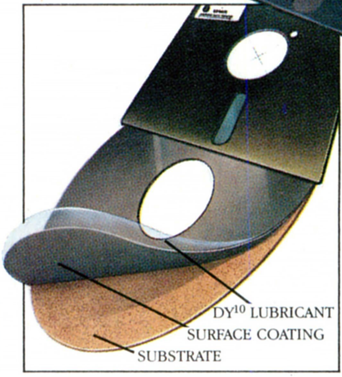
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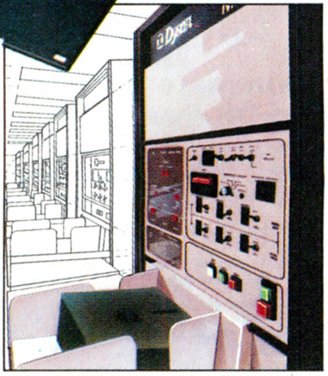

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Will we break away from traditional computing methods to explore the new territory Macintosh opens up?

MACINTOSH

(continued from page 85)

available from Apple sometime during the first quarter. Also available will be the Imagewriter, which is a $475 dot-matrix printer that is plug-compatible with Macintosh and will faithfully reproduce the various fonts, patterns, and styles you can create with text and graphics.

Tecmar, a developer of communications hardware for the IBM Personal Computer has announced that it will have its own DEC VT-100 terminal software, and a 300/1200-baud modem for Macintosh available within a month. It will also be offering a removable cartridge hard disk and a printer buffer with a standard Centronics-type interface within the same time frame. Since Apple's own interfaces are nonstandard the Tecmar buffer will make the connection between Mac and most printers on the market.

Davong, a manufacturer of Apple II and III hard disk drives, will be shipping an external hard disk and streaming-tape backup system in March, with an office communications network to follow in mid-year.

All together, these new products and third-party support indicate that industry confidence in Macintosh is high. So what about user confidence? Will the market pick up Apple's gauntlet and buy this new machine? That depends on each person's needs, of course. If you need to have a monster spreadsheet all in RAM at once, then Mac isn't for you. Or if you have to have media compatibility with MS-DOS computers, then Mac isn't for you. Or if you absolutely have to have a color display, then Mac isn't for you. But if you're willing to see just how this new computing works, and if you want a computer that beckons you to explore new ways of working and communicating, and that packs the finest personal-computer technology into a 21-pound, $2495 box, then the challenge may just be for you.

(continued from page 61)

used as much of main memory as they needed for the operating system and Quickdraw primitives—reportedly a full 512k when Lisa was first released—the cost goals of Macintosh meant they had to shrink that down to fit in 64k of Read Only Memory.

It took an extraordinary effort. Atkinson says the character drawing routine was redone from scratch 12 times, and only after his fourth complete pass over the assembly language code, squeezing a byte here and a byte there, was Andy able to make it all fit.

Everyone on the project credits Jobs with motivating his small, hand-picked team to such extraordinary efforts: Up until the announcement of Macintosh there were 30 to 40 people working 100 hour weeks, their lives devoted to getting the little baby out the door. This was a changed man from the Jobs who very early in the project bet John Couch, head of the Lisa project, that Macintosh would be introduced first. Jobs had long-since paid his debt when Mac was finally ready for unveiling, and Atkinson says Macintosh was all the better, and Apple's chairman all the wiser for it. "He learned that you don't have a baby in six months. It takes nine months even if you're Steve Jobs."

Though the intent from the beginning was to provide only part of Lisa's capability, the Macintosh team thinks they actually built a better machine. "In order to appeal to as many people as we want to, a machine has to respond almost instantly," says Andy. "And that's something Lisa sort of blew. Not Macintosh. Macintosh is *fast*."

A hero accesses Mac's soul

Macintosh came close to staying in Apple's labs even beyond this January 24th. About a year-and-a-half into the Mac project, disaster struck. Bud Trible, the software architect, had to go back to medical school. He had started on the project with the belief, fostered by Jobs, that he would be able to complete the work during his year's leave of absence. He extended that leave by six months, but finally went back when he was told he had to take the spot they were holding for him in med school or let it go to someone else.

"Everybody was really down," says Atkinson, "but Andy met the challenge when we threw Bud's responsibilities on him." The Mac team eventually gave Andy Hertzfeld a thick, solid-bronze hero medal for holding the project together. "Andy's got the soul of Mac tied down," says Atkinson. "He's always thinking in terms of the user and what's so special and wonderful about Mac from that point of view."

Talking about hero medals is a little tough for Hertzfeld. But ask him what Macintosh is all about and he talks easily, watching your eyes to see if the spark of excitement has caught there yet. The dream, he explains, began when they first saw Lisa running. "But you couldn't have a revolution if only fat cats could take part," he says. The dream became *The People's Lisa*.

"We had to change computing from drudgery into fun. We wanted to build a computer that would astonish and delight," he says. He speaks wistfully about the discovery that it simply couldn't be done for the original target price of $1500, but then the fervor returns.

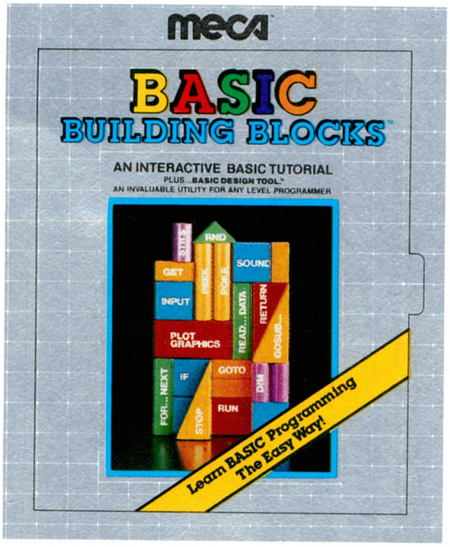
"IBM is threatening to take over," he says, "and make using a personal computer too boring to expect everybody to want one. Look at the industry—it's becoming nothing but IBM clones. Macintosh is the last chance. It can save computing from being mundane and no fun and change it into something alive and vibrant."

If Andy is bearer of the soul of Macintosh, he is also evangelist, an embodiment of the soul of the Macintosh project team: He's as close to a true believer as a man can be. He believes Macintosh is the best possible computer for the money. He believes Bill Atkinson's MacPaint will convince people that they don't have to choose between doing work and playing a game—that work can be fun. He harbors only the barest glimmer of uncertainty, and that is this: Will Apple sell enough Macintosh computers to really change the world?

—Kevin Strehlo, Associate Editor

"How MECA experts taught us more Basic in one hour than we learned in 12 hours from a book."

"BASIC BUILDING BLOCKS™ lets us interact with our computer and learn at our own pace. Dad says it's so easy to use, it even eliminates the need for him to read the manual. You should see all the programs Mom has written by herself. I like it because it really gets into the fun of the computer…fast. BASIC BUILDING BLOCKS is like having personal computer experts in our house."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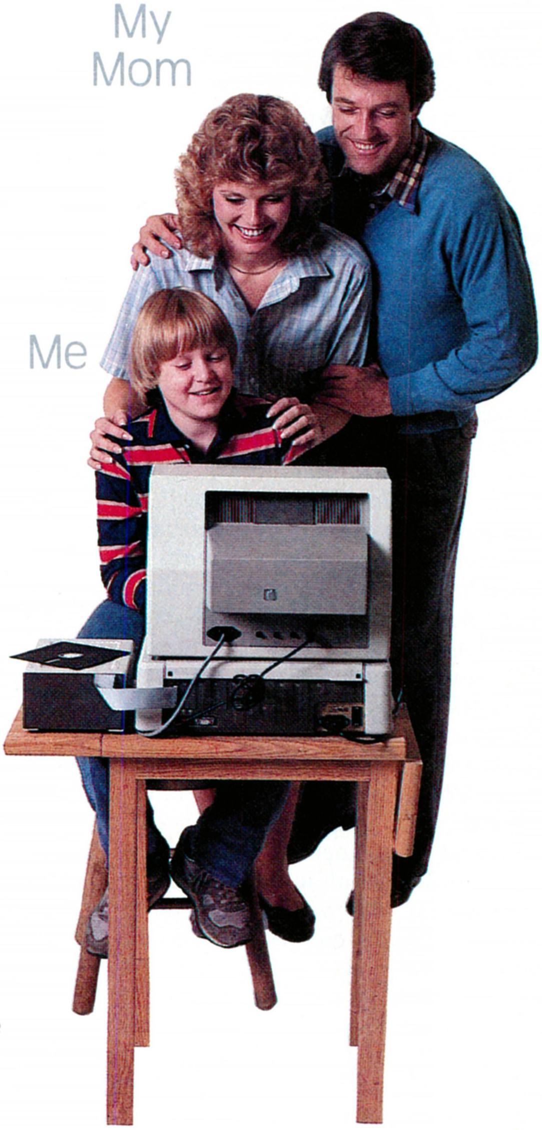
My Dad
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Me

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CIRCLE 181

CO·PROCESSORS

(continued from page 151)

your 4096 color palette and 512 by 512 pixel graphics you'll have to write the program to do so yourself. So, let's return to the original question: Is the person who buys a co-processor admitting that he's guilty of buying the wrong computer in the first place? It would seem not. The person who buys a Z80 card for an Apple or a Quadlink for an IBM is saying, "I like the machine I have, but there is one piece of software out there that I want, but that my machine will not run. This piece of hardware will let me run that software, and thus I'll buy it." He's not admitting a mistake; he's simply recognizing the realities of a market with multiple "standards."

The person who buys an Accelerator II for his Apple, or who will buy an Intel 8087 once it's supported by Multiplan or VisiCalc or Lotus 1-2-3 on the IBM isn't admitting a mistake either. He's saying, "I like this software, I like this machine, I just want to see it do its job faster."

And the person who buys a Saybrook co-processor, or one of the other 68000 co-processors, or a graphics co-processor like the Number Nine Graphic System—is he admitting a mistake? Once again, the answer is "no." He's simply saying that he wants to be on the forefront of technology, that he wants to explore all the possibilities raised by silicon chips and video displays, and that he's willing to forge on ahead without the kind of support that's given less esoteric products.

In the end, then, the story of co-processors becomes not one of "buyer, beware," but instead "buyer, be aware"—be aware of what they do and what they offer you, and make your decision on whether you need one on those grounds. My old friend Filbert's plan to beat the gas crisis may have been out of line, but a new, alternate engine might do you and your computer a world of good.

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CIRCLE 23

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TRANSPORTABLES

(continued from page 103)

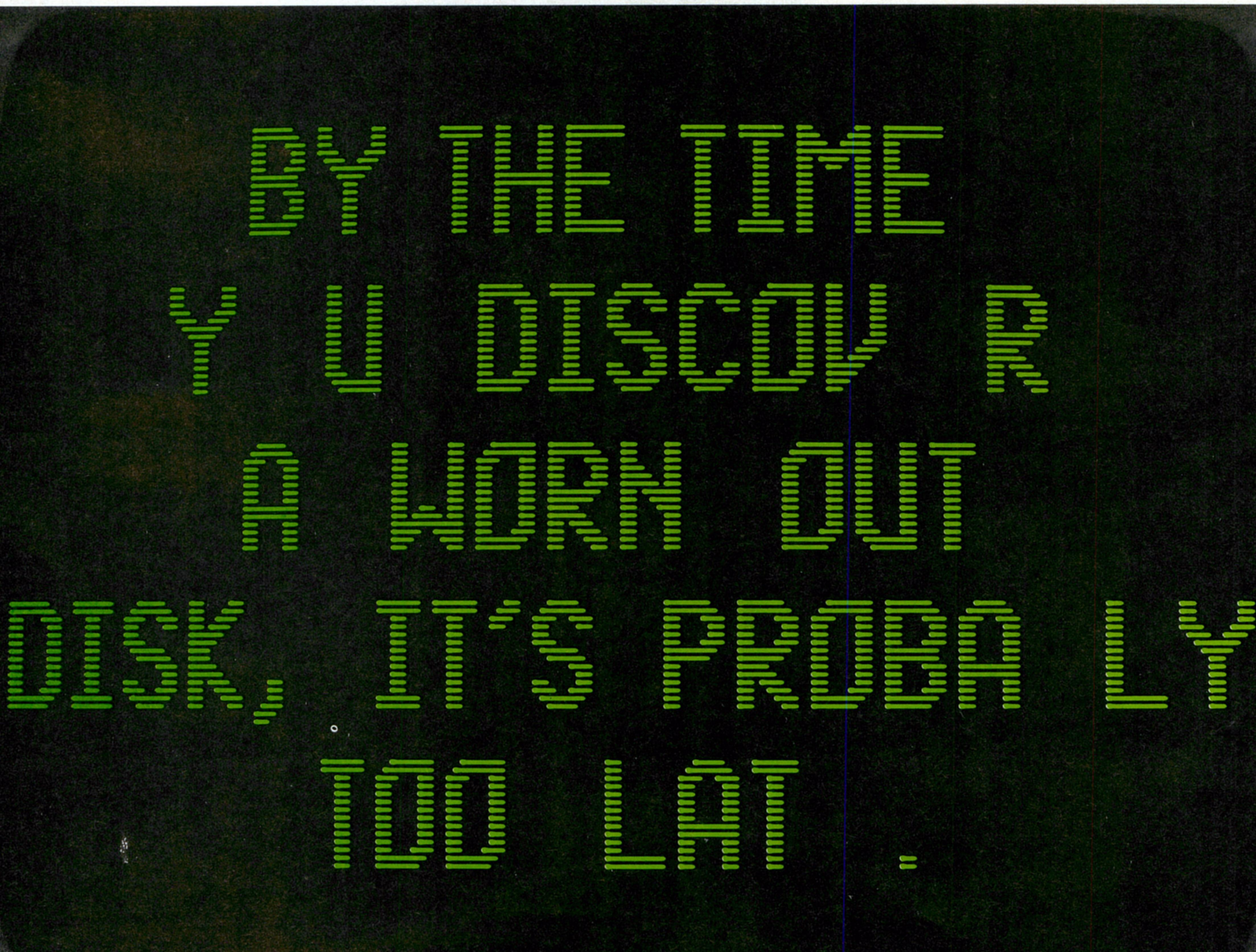
sonal Computer installed in his office to give him direct entry into the company's computer system as well as modem access to information he would otherwise have to order—and wait for—from the company library. The Personal Computer at the office will help him finally tame the mainframe, but setting up a portable in a sheltered corner at home and tying in with a supportive network of other managerial users gave him what he needed to realize he could win out.

The concept of transportability leads inevitably to examining our own common perception of the ideal personal computer as a self-contained, free-standing machine rather than as a communicative device. The new generation of lap-size portables is illustrating that the essence of transportability may lie chiefly in staying in touch with one's own important bases.

Steve Lesnick doesn't generally do business when he's golfing, but he listened to the Epson representative's offer to let him try out the four-pound, battery-powered HX-20 computer with elementary word processing and other functions. As president and CEO of Kemper Sports Management in Chicago, Lesnick actually does a lot of business around golf courses, and future golf courses. His firm consults in designing and managing them, along with country club facilities and pro tournaments.

The salesman bet that Lesnick would abandon the typewriter he's had in his office since his days as a journalist once he realized what the Epson could do. "Presto," says Lesnick, "I had an HX-20 in my office." With no previous hands-on computer experience, he was surprised that he got word processing "down pat in one evening." About two weeks later he moved the typewriter out of his office.

Lesnick is a frequent traveler, and the HX-20 goes with him, serving as his in-flight notepad (he has yet to be told by an airline not to bring it on board), printing out short messages on the narrow paper roll, or storing sometimes lengthy contract drafts on tape cassettes to print out when he is back in his office, or to pass on to his



> *"By the time I got to the next appointment, I would have the work done from the previous one."*

secretary's Epson station via modem. With the expansion unit that gives room for the modem program and more text files, the machine is still only about as big as a packet of legal-size paper. It, the modem, and the recharger fit in one side of his briefcase.

Extension of intellect

Douglas Strain, chairman of Electro Scientific Industries in Portland, Ore., is an equally enthusiastic convert to the lap computer; his is the Radio Shack Model 100. He calls it an "extension of the user's own intellect," especially because this is the first computer he's used that has really been with him whenever he wants it. Like Lesnick, Strain uses his computer "on the airplane, waiting in the airport, waiting for appointments, filling in chunks of time writing memos, notes to myself," or communicating with people or data banks through the EIES network.

Of his recent trip to Europe to promote a public stock offering, Strain says, "By the time I got to the next appointment, I would have all the work done from the previous one. The ability to store that material and review it is terrific." When using the Model 100's modem, Strain had some trouble with non-standardized phone plugs in Europe, but a Radio Shack adaptor allowed him to cope with most situations. He had more trouble in England than on the Continent, and occasionally found that the signals his computer generated seemed to disconnect the phone.

Strain's own discovery of more and more transportable computing has made him impatient with the ambivalent attitudes of many of his junior managers.

Those who know the new transportability of computers will understand why Strain is counting on the new technology to break down the resistance many managers still have toward personal computer use. A machine that can fathom a mainframe, then travel home for an evening or around the world, providing its owner with instant information from anywhere, will quickly leave behind those who leave it behind.

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CIRCLE 209

FilePlan. Orga
a spreadsheet organ

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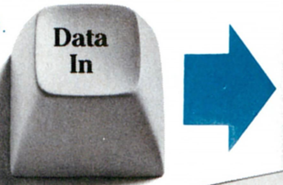

Like a spreadsheet, FilePlan™ puts data in rows and columns. You can scroll over your entire worksheet to see everything.

Type in any information you need to file and update—customer lists, expense records, addresses, projects due, personnel records, purchase orders.

It's easy because FilePlan works like you think. You don't have to set up a program. Just plunk in the data, *then* decide how you want to sort it, update it, retrieve it, combine it, display it on the screen and print it out. A menu of actions is always available. Help is a keystroke away.

If you'd rather see one entry at a time, just flip into "forms" mode. You can enter data either way.

The information is totally under your control.

Say you've made a file of customer orders with amounts and dates. FilePlan will automatically re-sort the list with every entry.

Then, before your next trip to Cleveland, you can:

List everyone in Cleveland who ordered within the last six months.

Exclude anyone whose order was under $500.

Rank the customers by their total orders.

Print out mailing labels. Formats are easy to set up with MemoPlan™ or any word processor.

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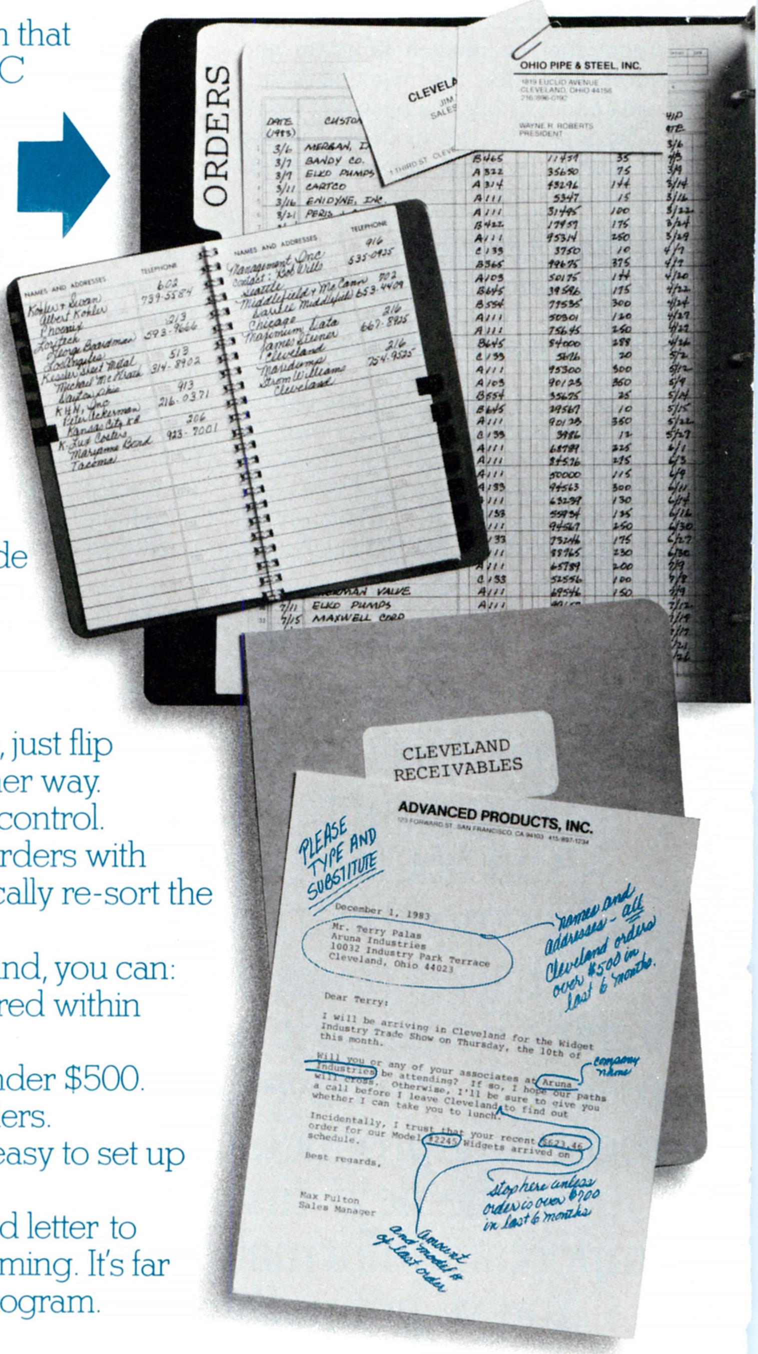
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December 1, 1983

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Dear Terry:

I will be arriving in Cleveland for the Widget Industry Trade Show on Thursday, the 10th of this month.

Will you or any of your associates at Aruna Industries be attending? If so, I hope our paths will cross. Otherwise, I'll be sure to give you a call before I leave Cleveland to find out whether I can take you to lunch.

company name

Incidentally, I trust that your recent $623.46 order for our Model #2245 Widgets arrived on schedule.

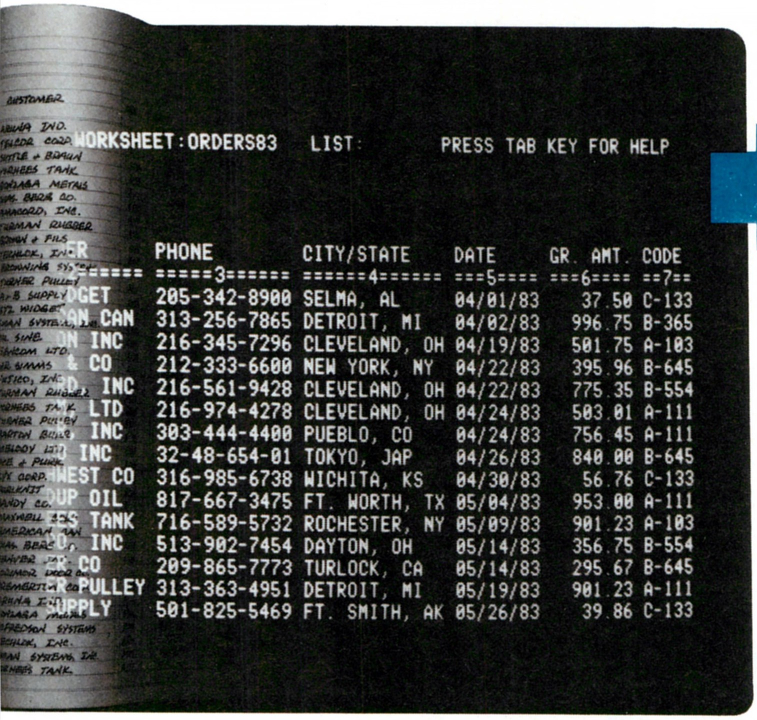
stop here unless order is over $700 in last 6 months

Best regards,

Max Fulton
Sales Manager

amount and model # of last order

nizes your files like
izes your numbers.



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WORKSHEET:ORDERS83   LIST:        PRESS TAB KEY FOR HELP

       ER   PHONE        CITY/STATE     DATE      GR. AMT. CODE
=======     =====3====== ======4======  ===5====  ===6==== ==7==
    DGET    205-342-8900 SELMA, AL      04/01/83    37.50 C-133
  AN CAN    313-256-7865 DETROIT, MI    04/02/83   996.75 B-365
  ON INC    216-345-7296 CLEVELAND, OH  04/19/83   501.75 A-103
    & CO    212-333-6600 NEW YORK, NY   04/22/83   395.96 B-645
  D. INC    216-561-9428 CLEVELAND, OH  04/22/83   775.35 B-554
     LTD    216-974-4278 CLEVELAND, OH  04/24/83   503.01 A-111
     INC    303-444-4400 PUEBLO, CO     04/24/83   756.45 A-111
     INC    32-48-654-01 TOKYO, JAP     04/26/83   840.00 B-645
 WEST CO    316-985-6738 WICHITA, KS    04/30/83    56.76 C-133
 OUP OIL    817-667-3475 FT. WORTH, TX  05/04/83   953.00 A-111
 ES TANK    716-589-5732 ROCHESTER, NY  05/09/83   901.23 A-103
  O. INC    513-902-7454 DAYTON, OH     05/14/83   356.75 B-554
      CO    209-865-7773 TURLOCK, CA    05/14/83   295.67 B-645
ER PULLEY   313-363-4951 DETROIT, MI    05/19/83   901.23 A-111
  SUPPLY    501-825-5469 FT. SMITH, AK  05/26/83    39.86 C-133
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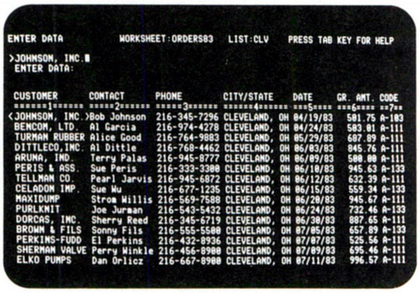

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ENTER DATA          WORKSHEET:ORDERS83   LIST:CLV    PRESS TAB KEY FOR HELP

>JOHNSON, INC.█
 ENTER DATA:


 CUSTOMER       CONTACT      PHONE        CITY/STATE     DATE     GR. AMT. CODE
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<JOHNSON, INC.>Bob Johnson  216-345-7296 CLEVELAND, OH 04/19/83   501.75 A-103
 BENCOM, LTD.  Al Garcia    216-974-4278 CLEVELAND, OH 04/24/83   503.01 A-111
 TURMAN RUBBER Alice Good   216-764-9883 CLEVELAND, OH 05/29/83   687.89 A-111
 DITTLECO,INC. Al Dittle    216-768-4462 CLEVELAND, OH 06/03/83   845.76 A-111
 ARUNA, IND.   Terry Palas  216-945-8777 CLEVELAND, OH 06/09/83   500.00 A-111
 PERIS & ASS.  Sue Peris    216-333-3300 CLEVELAND, OH 06/10/83   945.63 A-133
 TELLMAN CO.   Pearl Jarvis 216-945-6872 CLEVELAND, OH 06/12/83   632.39 A-111
 CELADON IMP.  Sue Wu       216-677-1235 CLEVELAND, OH 06/15/83   559.34 A-133
 MAXIDUMP      Strom Willis 216-569-7588 CLEVELAND, OH 06/20/83   945.67 A-111
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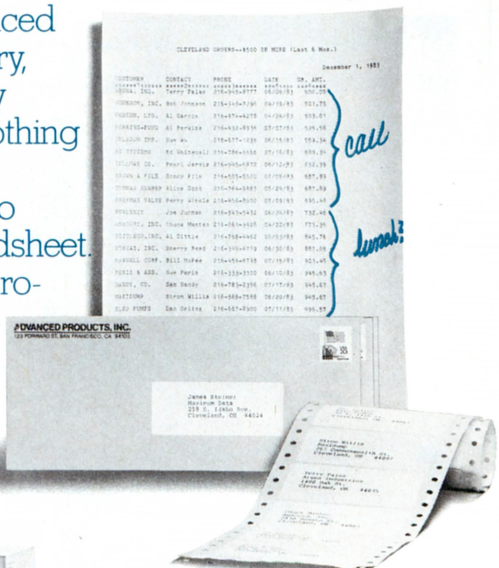

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CIRCLE 15

> *"A data base is a neat way of keeping data in one place and accessing it in a number of ways with programs."*

DATABASE SOFTWARE

(continued from page 124)

al market for a number of reasons. They don't need the services of a programmer, nor do they require their user to learn any programming for their use. Often, they have smaller capacity than a relational system. They don't allow relating one file to another, nor do they allow you to work on more than one file at a time. But they do allow you to get your data-base application up and running very quickly, and you can do it by yourself.

There are still other questions that bear examination, although they should not concern you as much as those we asked earlier. One is the question of speed. How fast should a data-base manager be? The answer here depends on the application, but first you have to ask what speed means to you. Is it how fast the program can find a specific record, or is it how fast the program can sort a 1000-record file? (Sorting is important—almost every report will have to be sorted in some way or another.) In the case of our personnel department, both speed measures would apply, but both would also probably be meaningless. In many applications, asking how fast the computer should do something is like asking how fast a car should go. The computer and the car are so much faster than the alternatives—manual data gathering and walking, respectively—that the question turns out to be academic. If you have a very large data base, then sort speed may be a factor. Or if you want your data-base manager to operate in a real-time environment, like order entry performed by telephone operators, then record-retrieval speed can play a part. For most applications, the computer's speed is so much greater than the alternative that the question has little practical merit.

What can't *I do?*

A data-base manager won't, initially, save you time. As a matter of fact, setting it up will take *more* time. Gibbons says that data-base management is a low-payoff productivity enhancer, because it takes so much time to get the data into the computer in

Introducing the new Scorpion ....
EXPLORE THE MOON

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The Scorpion is a versatile robot designed especially for the serious robot enthusiast. By following the detailed instructions included in the kit, you can build this highly sophisticated and entertaining device. With 32 lines of I/O and complex machine intelligence capability, it is completely software programmable. Among the many talents of the Scorpion are its ability to see and read codes, to learn obstacle locations and avoid them, and to follow a tape on the floor at 99 different speeds.

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RS-232 C serial interface allows the Scorpion to obey instructions and answer questions from any host computer with a serial printer interface.

6502 microprocessor on board with 8K of EPROM and 2K of RAM, expandable to a full 64K system.

The special Scorpion language with 30 instructions is explained in detail in the 130 page manual (8½ × 11) accompanying the kit.

The two axis optical scanner provides data for pattern recognition and camera experiments. Over a 300 degree scan in both vertical and horizontal planes. The visual patterns can be displayed in the computer CRT.

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CIRCLE 122

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- **EXPLORE** ***new uses for your computer***

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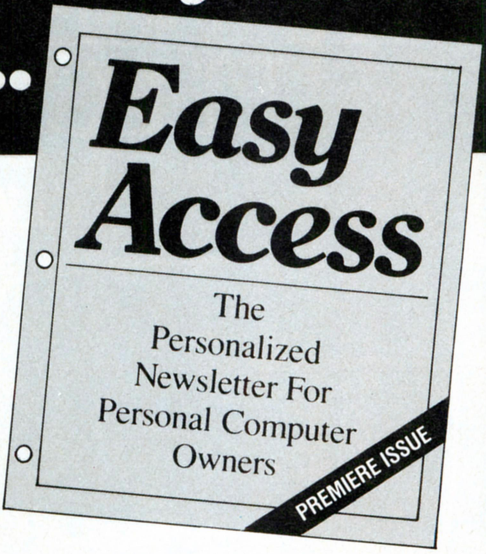
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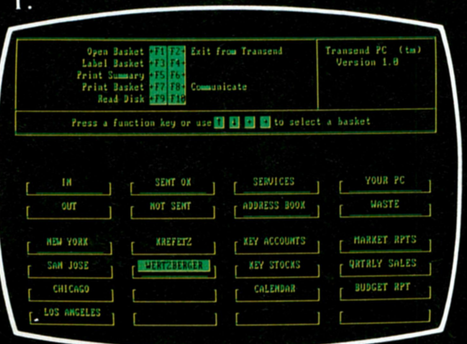
CIRCLE 131

WORDS CAN'T DESCRIBE THE EASE OF USING TRANSEND PC™ FOR ELECTRONIC MAIL.

1.



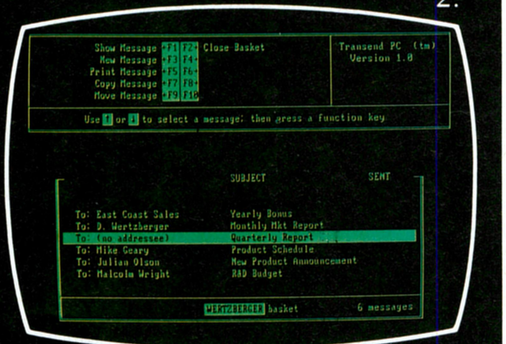
```
Open Basket ←F1 F2→ Exit from Transend        Transend PC  (tm)
Label Basket ←F3 F4→                            Version 1.0
Print Summary ←F5 F6→
Print Basket ←F7 F8→ Communicate
Read Disk ←F9 F10

Press a function key or use ↑ ↓ ← → to select a basket

[    IN     ]  [  SENT OK   ]  [  SERVICES   ]  [  YOUR PC   ]
[    OUT    ]  [  NOT SENT  ]  [ ADDRESS BOOK]  [   WASTE    ]

[ NEW YORK  ]  [  KREFETZ   ]  [KEY ACCOUNTS ]  [MARKET RPTS ]
[ SAN JOSE  ]  [WERTZBERGER ]  [ KEY STOCKS  ]  [QRTRLY SALES]
[  CHICAGO  ]  [            ]  [  CALENDAR   ]  [ BUDGET RPT ]
[LOS ANGELES]  [            ]  [             ]  [            ]
```

2.



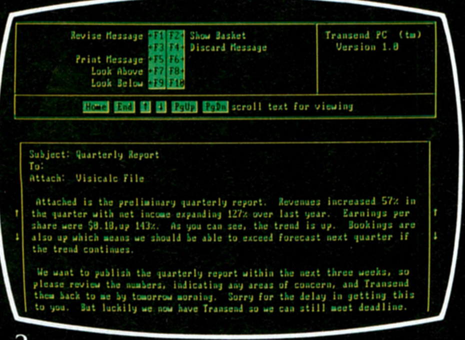
```
Show Message ←F1 F2→ Close Basket             Transend PC  (tm)
New Message ←F3 F4→                             Version 1.0
Print Message ←F5 F6→
Copy Message ←F7 F8→
Move Message ←F9 F10

Use ↑ or ↓ to select a message; then press a function key

                               SUBJECT                     SENT

To: East Coast Sales           Yearly Bonus
To: D. Wertzberger             Monthly Mkt Report
To: (no addressee)             Quarterly Report
To: Mike Geary                 Product Schedule
To: Julian Olson               New Product Announcement
To: Malcolm Wright             R&D Budget

                       WERTZBERGER basket          6 messages
```



```
Revise Message ←F1 F2→ Show Basket            Transend PC  (tm)
               ←F3 F4→ Discard Message          Version 1.0
Print Message ←F5 F6→
Look Above ←F7 F8→
Look Below ←F9 F10

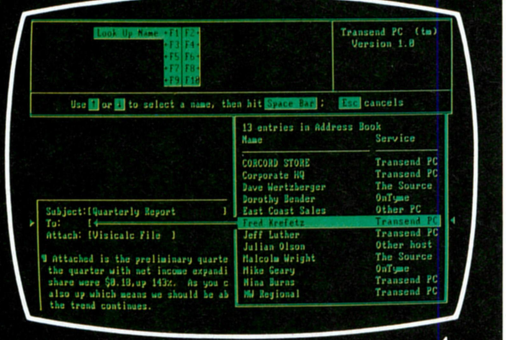
Home End ↑ ↓ PgUp PgDn scroll text for viewing

Subject: Quarterly Report
To:
Attach:  Visicalc File

 Attached is the preliminary quarterly report.  Revenues increased 57% in
the quarter with net income expanding 127% over last year.  Earnings per
share were $0.10,up 143%.  As you can see, the trend is up.  Bookings are
also up which means we should be able to exceed forecast next quarter if
the trend continues.

 We want to publish the quarterly report within the next three weeks, so
please review the numbers, indicating any areas of concern, and Transend
them back to me by tomorrow morning.  Sorry for the delay in getting this
to you.  But luckily we now have Transend so we can still meet deadline.
```

3.



```
Look Up Name ←F1 F2→                          Transend PC  (tm)
             ←F3 F4→                            Version 1.0
             ←F5 F6→
             ←F7 F8→
             ←F9 F10

Use ↑ or ↓ to select a name, then hit Space Bar ;  Esc cancels

                                 13 entries in Address Book
                                 Name                  Service

                                 CORCORD STORE         Transend PC
                                 Corporate HQ          Transend PC
                                 Dave Wertzberger      The Source
                                 Dorothy Bender        OnTyme
Subject:[Quarterly Report      ] East Coast Sales      Other PC
To:     [←                       Fred Krefetz          Transend PC
Attach: [Visicalc File  ]        Jeff Luther           Transend PC
                                 Julian Olson          Other host
¶ Attached is the preliminary quarte Malcolm Wright    The Source
 the quarter with net income expandi Mike Geary        OnTyme
 share were $0.10,up 143%.  As you c Nina Burns        Transend PC
 also up which means we should be ab MW Regional       Transend PC
 the trend continues.
```

4.

SCREENS CAN.

The screens say so much, you may never need the manual. Transend PC turns your IBM PC into an electronic workstation or an intelligent terminal. Four screens show how easy it is to use:

1. Transend PC uses IN and OUT baskets just like you do. To choose one, hit a key.

2. The basket shows what's inside. To choose a document, hit a key and *voila*!

3. It's full size. You can read, edit, file, address or toss it (Note the WASTE basket on screen 1).

4. To route or address a document, pick a name from the ADDRESS basket. Transend PC does the rest.

To mail it over the phone, move it to the OUT basket and hit another key. Transend PC dials the addresses; delivers (through SOURCE-MAIL℠, OnTyme®, or direct to another PC); checks for incoming mail; and signs off. You don't have to set up anything or learn any parameters. Transend does everything automatically.

Transend PC works with *all* other software packages like 1-2-3™, WordStar®, and VisiCalc®. You can label baskets to handle all your paperwork. And Transend PC lets your IBM PC talk to any other computer.

For a closer look at the screens, ask your dealer for a demo. For a closer look at electronic communications, ask for a free copy of *The Who, What, Why, How and When of Electronic Communications* from Transend.

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CIRCLE 100

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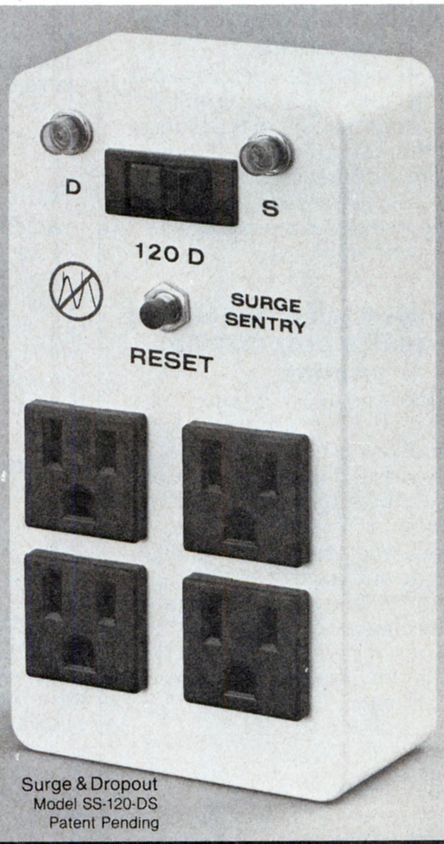
All of a company's data can be collected in one place, called a data base.

the first place. You don't get the benefit of all that work until it's done, and then the benefit is in the manipulation of the data, not in the entering.

It's getting easier to accomplish this task, by the way. Many integrated packages are now available that allow data input through a word-processor-like interface. Examples are MetaFile and Jack 2, the latter a brand-new product from Business Solutions in Kings Park, New York. Both of these programs allow you to design an input form when that makes sense, or just type a document, when that seems to be valid. Into the form or letter you can imbed calculations, or even rows and columns of calculations—like a spreadsheet. Jack 2 lets you graph on the same document. And while these products are organized around the data base, others, like 1-2-3 from Lotus Development, are based on the spreadsheet metaphor itself, which, "is very general and powerful, a very efficient way of displaying data," says Chris Morgan, vice-president of communications for the company.

If there is any trend in the data-base management business these days, it's toward the integrated package. Condor talks about it as the data manager. MetaFile and Jack 2 speak in terms of being output oriented. Filing people, like Software Publishing, speak about common interfaces to a number of products, and file compatibility between them. As time goes on you can expect to see the integrated concept, whether implemented in a single package or through the idea of a windowing environment, become more prevalent.

Until that time, though, the best you can do is try to wade through the confusing facts using the criteria we've supplied. Remember that selecting a data-base management program starts with knowing what you want to get done: how much data; how many fields and characters; what kinds of reports. It will also help to know how much time you're willing to put in to make it work, and how much time can you afford. The salesman in the store may not be able to give you the answers you need, but careful researching of these questions will help you make your choice.



Kill Surges Like Lightning!

New 3-stage, 3-way common mode ***SurgeSentry***® kills high-speed, high-energy *transients within picoseconds* (trillionths of a second) *before* they can destroy your data, disrupt programs or damage valuable equipment. Certain types of equipment are susceptible to damage when the power line voltage suddenly drops to a low value, or goes out altogether, and then comes on again in a power-up surge. With the Surge & Dropout model, when power drops below a safe level, the unit shuts off. This allows you to check and reset your equipment before returning power. Indicator lights tell you at a glance if a dropout has occured. Power is restored by pushing the SurgeSentry's 'reset' button.

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CIRCLE 167

There are over 150 word processing packages for personal computers.

Spellbinder is the best. Here's why.

You can do more with Spellbinder. It's so simple that a beginner can use it immediately. Yet it delivers the capabilities and programmability of the most advanced word processing systems:

Complete office management capabilities. Including forms processing.

With Spellbinder, word processing is just the start. You can create forms. To fill out the forms, just fill in the blanks on your computer screen. Spellbinder can print the information on preprinted forms paper. It will even do the math for invoices, estimates and other documents with numbers.

You can take full advantage of high quality proportional printing.

Spellbinder and a high quality printer can make every document look professionally typeset. Proportional character spacing is easy: Just choose an option on the screen. You can define different margins for printing pages back-to-back, and select from many options for page and page title formats, multiple copies, and two-column printing. You can change spacing, fonts, or other features in the same document. And Spellbinder offers several special character formats.

More mailroom capabilities than most mailroom systems.

Spellbinder automates a range of mailing needs, from individual to mass correspondence. It can insert the address in a letter; log each letter; and file it to your disk. Automatically.

Spellbinder can merge any document with selected information from your mailing list. It can pull and sort a specialized list from your master address file. And Spellbinder addresses envelopes or mailing labels.

Built-in calculator. The logical addition to word processing.

How many times have you interrupted your word work to do number work? Now Spellbinder performs addition, subtraction, multiplication and division automatically down columns or across rows. You do the writing; Spellbinder takes care of the rest.

Spellbinder does everything *faster.*

You work faster because Spellbinder works faster. Your work takes fewer keystrokes. Spellbinder is written in assembly language, so it does each task with fewer machine operations. And the Spellbinder manual provides logical command listings and simple explanations so you don't have to think about software.

Plus these additional features:

Simple cut-and-paste capabilities let you move, copy, and delete text.

Automatic text reformatting features correct margins and paragraph endings after you've deleted or added text.

Indents whole paragraphs in a single command.

Boilerplate texts and keyphrases: You can store commonly used phrases and paragraphs to insert into your text with a single keystroke.

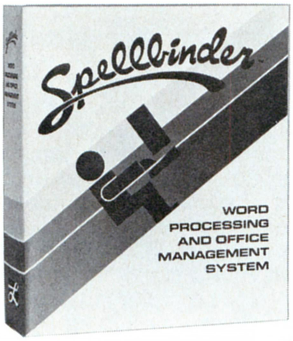
Line numbering on the left margin.
Extensive search/replace options.
Versatile print formatting.
Compatible with virtually any printer.
Easy to customize.

Works with every major microcomputer. And with other software packages.

Spellbinder runs under every major 8-bit and 16-bit microcomputer operating system, such as CP/M-86,® Concurrent CP/M,® MS-DOS,® Turbo-DOS,® and Oasis.® And it works with most database management, accounting and spreadsheet systems.

More stars than WordStar.® Easier than EasyWriter II.® More perfect than Perfect-Writer.®

You've read the ad. Now see the real thing. Take this ad to your Spellbinder dealer. Ask for a demonstration. And discover the difference between 150 word processing systems and *the best*: Spellbinder.



Spellbinder

Spellbinder Word Processing and Office Management System.
A product of Lexisoft, Inc.
Box 1378, Davis, CA 95616 □ (916) 758-3630

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Oasis is a registered trademark of Phase One Systems, Inc.
EasyWriter II is a registered trademark of Information Unlimited Software, Inc.

CIRCLE 12

Looks like a Ferrari. Drives like a Rolls. Parks like a Beetle.

39
POWER
BUSY
PROTECT
PROTECT
DRIVE TYPE
TRACK
ERROR
INDUS GT

Ask your computer dealer to take the cover off a world-class disk drive.

The all new, 1984 Indus GT.™

The most advanced, most handsome disk drive in the world.

A flick of its power switch can turn an Atari into a Ferrari.

Or an Apple into a Red Hot Apple.

Looks like a Ferrari.

The Indus GT is only 2.65″ high. But under its front-loading front end is slimline engineering with a distinctive European-Gran flair.

Touch its LED-lit CommandPost™ function control AccuTouch™ buttons. Marvel at how responsive it makes every Atari or Apple home computer.

Drives like a Rolls.

Nestled into its soundproofed chassis is the quietest and most powerful disk drive power system money can buy. At top speed, it's virtually unhearable. Whisper quiet.

Flat out, the GT will drive your Atari track-to-track 0-39 in less than one second. Increasing data transfer 400%. (Faster than any other drive. And as fast as any Apple disk drive.)

And each GT comes with the exclusive *GT DrivingSystem*™ of software programs.* World-class word processing is a breeze with the *GT Estate WordProcessor*.™ And your dealer will describe the two additional programs that allow GT owners to accelerate their computer driving skills. *Included as standard equipment.

Also, the 1984 Indus GT is covered with the *GT PortaCase*.™ A stylish case that conveniently doubles as a 80-disk storage file.

Parks like a Beetle.

The GT's small, sleek, condensed size makes it easy to park.

And its low price makes it easy to buy. $449 for Atari. $329 for Apple.

So see and test drive the incredible new 1984 Indus GT at your nearest computer dealer soon.

The drive will be well worth it.

INDUS™

The all-new 1984 Indus GT Disk Drive.

The most advanced, most handsome disk drive in the world.

For dealer information, call 1-800-33-INDUS. In California, 1-800-54-INDUS, 213/882-9600.

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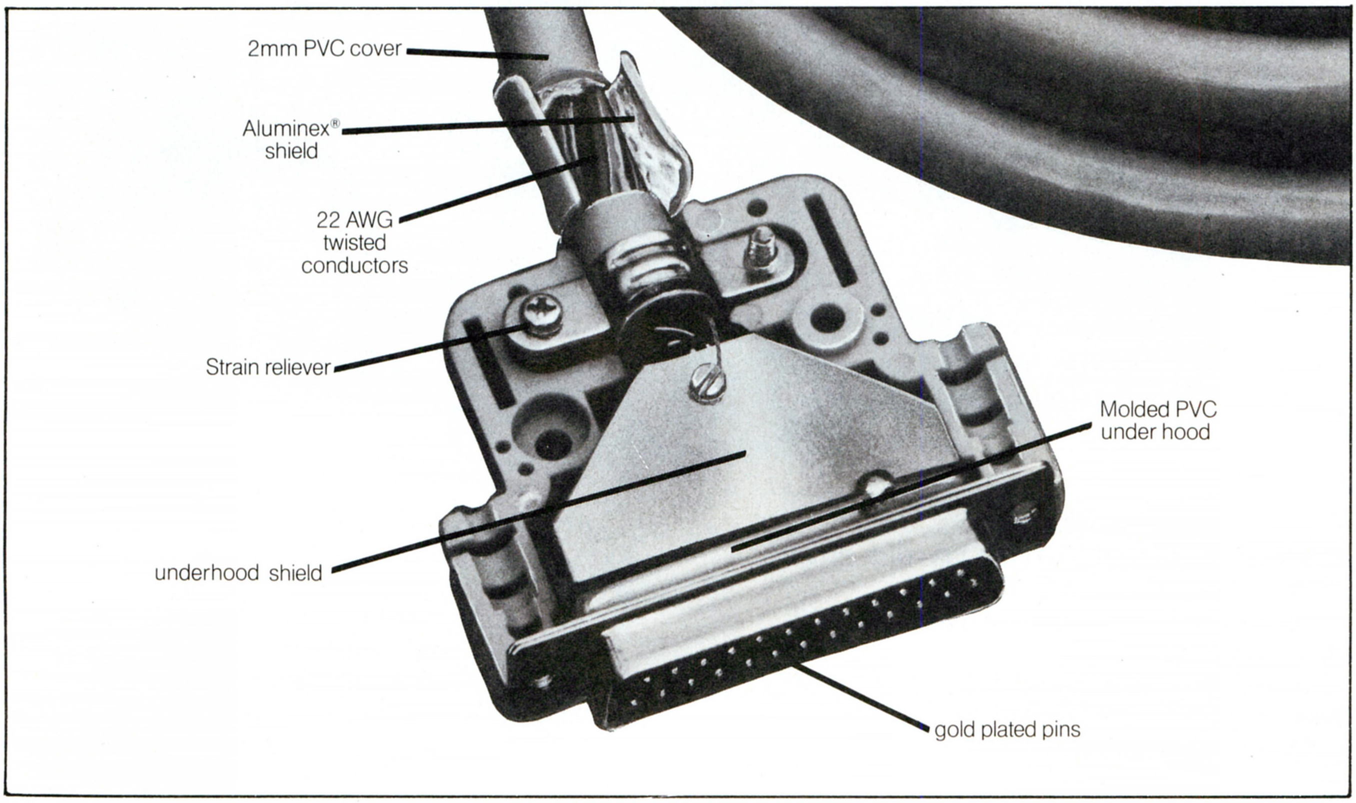
CIRCLE 123

ANNOUNCING THE INSIDE STORY ON DATA SPEC™ CABLES.



Take a look at the picture above. The shielding under the RS232 connector hood of DATA SPEC™ cables is different from anything you've seen before. No flimsy foil. Or painted hood. Instead, DATA SPEC™ gives you an extra heavy gauge shield under the normal hood which ensures that the cables exceeds the FCC requirements on emission standards.

And, if you look further inside, under the shield, you'll see the advent of PDT™* Technology. DATA SPEC™ cables are the first to employ this technique outside of aerospace applications. PDT Technology ensures that you will never have to solder a broken joint or even open the hood.

However, the biggest news is actually the littlest part of the story. The price.

You can find out about it at your dealer who carries DATA SPEC™ products. Modern manufacturing techniques have made DATA SPEC™ cables priced lower than lesser quality shielded cables.

DATA SPEC™ cables. There's more to it than meets the eye.

*PDT (Poly-vinyl doping technique) involves the injection of poly-vinyl under the shield to fuse the conductors and pins together, thus ensuring reliability under the most adverse conditions. PDT is a registered trademark of Advanced Tool Technology Inc.

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A Look At The Latest Releases

▨ Questions And Answers On Word Processing ▨ Electronic Life ▨ The Easy Guide To Your Apple II ▨ Introducing The Unix System ▨ The Office Automation Primer

Inquiries From The Public

QUESTIONS & ANSWERS ON WORD PROCESSING
PETER A. MCWILLIAMS
PRELUDE PRESS
LOS ANGELES, CA
216 pp., $9.95

Peter A. McWilliams is a poet. In his book, he takes great pains to make sure you know that. The only reason he writes books about computers, he says, is for the money. But that isn't to say that he isn't interested in the subject—he does use a word processor, and thinks it's a great boon to the writing profession. After all, it's enabled him to write six books about personal computers and word processing.

His latest, *Questions & Answers on Word Processing*, purports to consist of questions and answers based on his last book, *The Word Processing Book*. There are indeed questions and answers in the book, and some of them even relate to word processing.

In actuality, *Questions & Answers on Word Processing* is a rather amusing description of the trials and tribulations of a poet compelled—by the lure of money—to write six books about personal computers and word processing. He enumerates the great rewards he has derived from this process (the aforementioned money and meeting William F. Buckley, Jr., to whom the present volume is dedicated), as well as the tribulations he has suffered (computer-book editors and critics). In addition, he offers advice to the budding computer-book author on how to get his missive published ("When in doubt, mention IBM").

At long last McWilliams is able to tell his public that, when he writes, he still uses his first word processor, which runs on a NorthStar Horizon with a TeleVideo 950 terminal. He reveals his favorite communications program (LYNC by Norton-Lambert), how his publishing company got its name (after his car, a Honda Prelude), and his feelings about secretaries and creative writing ("Secretaries are some of the most creative writers around").

The most enjoyable thing about this book is its illustrations, and, fortunately, they make up about three-fourths of the total pages—I counted at least 125 separate illustrations, many of them full-page, in a 216-page book. These are mostly old etchings and woodcuts, with a few stills from old movies thrown in—like the ones you see in flyers from Beagle Bros or Huntington Computing. To make sure you understand that these do relate to the topic, however, some of them even have humorous captions that mention computers.

There is also a complete series from Garry Trudeau's "Doonesbury" comic strip, entitled *The Reverend Scot Sloan Buys a Word Processor*. By putting this at the end of the book, McWilliams is holding true to the tenet of saving the best for last.

Unfortunately, McWilliams occasionally talks about computers, and at those points, the book becomes less exciting. The IBM Personal Computer is extolled: "IBM is the new standard for personal computers . . . the signs of an IBM victory are everywhere;" IBM compatibility is also discussed: "As of now, if you want 100 percent IBM-compatible, you'll have to buy an IBM;" and Apple, as usual for McWilliams, is vilified.

Surprisingly, for someone with such a clear-cut preference in writing about Apples and IBMs, McWilliams sometimes confuses the two. He writes, " . . . with the PC, IBM made usually-secret schematics available to all . . . . IBM invited other manufacturers to make peripherals . . . ," which sounds a lot more like Apple than IBM, to me. But he does insist that "I don't feel I've been vindictive in my 'personal crusade against Apple computers,'" although for some reason I don't feel reassured about his impartiality.

All computers aside, though, McWilliams does seem to produce a highly entertaining book about himself, his experiences, and his personal views of word processing. If you've ever done word processing on an Apple, you might have trouble taking the book very seriously. Still, McWilliams's credo, "Have fun!" should be an inspiration for us all.

—*Orlan Cannon*

Contemplating The Mindless Machine

ELECTRONIC LIFE,
HOW TO THINK ABOUT COMPUTERS
MICHAEL CRICHTON
ALFRED A. KNOPF
NEW YORK, NY
209 pp., $12.95

Who is Michael Crichton to tell you how to think about computers? Judging from the often contradictory advice he imparts in this lively book, he has yet to work out all the kinks in his own thinking about them. He repeatedly stresses that a computer is a mere machine, mindless, "just a tool." So why did he call his book *Electronic Life*?

Michael Crichton is, of course, the debonair Harvard-educated physician who sold a novel, *The Andromeda Strain*, when he was fresh out of medical school. He then went on to direct *Westworld*, *Coma*, and other successful films. Having been introduced to computers as a student (at arm's length), and having been blessed with the intellectual curiosity, and the means,to find out more about them, he began fooling around with dedicated word processors fairly early in the game. Personal computers have been among his tools and toys for many years. This book grew out of written advice he privately circulated to his friends when they were getting started with personal computers.

In other words, Crichton is not a salesman, not a teacher, not a hacker. Computers are peripheral to the way he makes his living. He's a user, an opinionated, frequently witty, often arrogant, but always fluent old hand; he's just the kind of guy whose opinion you'd seek out if you were thinking of buying a personal computer, knowing ahead of time that you're free to take his advice or leave it.

The book's organization betrays the fact that the work originated in the files of a word processor. *Electronic Life* has little structure beyond a semi-alphabetical list of topics—only "semi"-alphabetical because a few topic titles have been gimmicked for purposes of rearrangement. Thus, instead of "Fear of Computers" we have "Afraid of Computers," which allows Crichton to kick off the book with the assertion: "Everybody is." Oh, yeah? The topics themselves seem to have grown haphazardly—the only rationale for some of them seems to be the author's desire to deliver a crotchety "harrumph," such as "There's a lot of fake computer processing around, and there's going to be more." (This is filed under "Fake.")

And there's some dubious advice, such as the assertion that if "all you really want is word processing, buy a dedicated word processor." How can you say what you "really want" until you've had a chance to play around for a few months?

But most of Crichton's advice is sound—back up everything, don't keep your disks near the telephone, and so on—and some of it is wise, like his suggestions to parents whose children are already expert: ". . . parents who find a way to permit their children to help them have an enormous advantage." Crichton's attitude toward the process of learning is straightforward. "Learning to run a computer is like learning to deliver a tennis serve, to cook a souffle, or to drive a car. You have to get out there and do it." He helps by providing entertaining, hands-on, take-charge routines for the Apple II and the IBM Personal Computer.

Electronic Life is at its best when Crichton leaves off pontificating and tackles his main argument. His section on "Mindless Machines, the Virtues of," its companion piece "Mistakes," and a number of other short essays scattered throughout the book do much to support his notion of computers as tools which every day become more and more indispensable.

This prospect is to be faced with common sense and even optimism. "The fear that in the coming years we will be replaced entirely by our creations—that we will live with our computers as our pets live with us—suggests an extraordinary lack of faith in human beings and their enterprise . . . . Human beings will always have something else to do. And so, for that matter, will their machines."

Don't read this book to learn about electronic life, a concept mentioned only in passing, then airily dismissed. Don't read this book to learn how *you* should think about computers.

Do read this book to find out how Michael Crichton thinks about computers.

—*Paul Preuss*

Apple On A Platter

THE EASY GUIDE TO YOUR APPLE II
JOSEPH KASCMER
SYBEX, INC.
BERKELEY, CA
147 pp., $9.95

This is a book for the computer novice who either wants a supplement to the Apple manuals or is looking for an introduction to the manuals.

While the writing won't win any prizes, the book is easy to read and covers a surprisingly large amount of information in less than 150 pages. And, by and large, the video screens used as illustrations are easily readable with white letters on a black background. They make a nice change of pace from the usual program listings in black type.

Kascmer has done a good job of putting the information together. The book shows the Apple II and IIe in a particularly good light.

—*Jeffrey Bairstow*

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CIRCLE 189

The Unusual Operating System

INTRODUCING THE UNIX SYSTEM
HENRY MCGILTON AND
RACHEL MORGAN
MCGRAW-HILL BOOK COMPANY
NEW YORK, NY
556 pp., $18.95

Although it hasn't yet become a flood, there has recently been a steady trickle of books about UNIX, the operating system developed at Bell Laboratories and now finding wide use in personal computers and minicomputers. This book is the best to date. Not only does it cover Version 7, the most widely used version of UNIX, it also gives excellent coverage to the modifications in another popular version developed at the University of California at Berkeley. I have used and struggled with both and wish I'd had this book before I got started.

UNIX is the front-runner as the operating system of choice for personal computers and workstations in the future. Radio Shack already offers a UNIX look-alike called XENIX for the Model 16, and there will soon be a true UNIX for the IBM Personal Computer. Several manufacturers are offering UNIX systems for under $5000.

Introducing the UNIX System stands a good chance of becoming the bible for newcomers to UNIX. The chapter on getting started is excellent and almost impossible to fault. The two following chapters on directories and files are remarkably comprehensive but easy to read. A large chunk of the book is devoted to text editing and formatting, which is as it should be: These features are precisely the ones that will cause the operating system's popularity to increase.

My only criticism of the book involves the chapter on the electronic-mail system, another UNIX tool. While the basic system is explained with the authors' usual clarity, the chapter is too brief and does not deal with the use of "escapes" which allow the user to do things like break away from mailing, execute other commands, read files and messages into a working letter, and so on. These escapes far exceed the capabilities of the public electronic-mail systems offered by CompuServe and The Source. Perhaps the authors will remedy this failing in the next edition, since this is clearly a book that will see many reprintings and revisions.
—*Jeffrey Bairstow*

From Word Processing To Office Automation

THE OFFICE AUTOMATION PRIMER: HARNESSING INFORMATION TECHNOLOGIES FOR GREATER PRODUCTIVITY
CAROLYN J. MULLINS AND
THOMAS W. WEST
PRENTICE-HALL, INC.
ENGLEWOOD CLIFFS, NJ
158 pp., $18.95 hardbound,
$9.95 paperback

A phenomenon that has long baffled publishers and writers is the occurrence of a single idea to several people at the same time. Here is yet another book based on the premise that office automation, once thought to be the wave of both the near and distant future for large organizations, is well on the way to becoming solidly entrenched in the daily activities of business at every level, and that the reason for this influx is that more and more businesses are discovering the marvels of word processing.

Once you have a word-processing system, it is only logical and sensible to proceed from there to obtain the highest possible productivity by combining already available equipment, software, and personnel. If word processing is on the scene, then can office automation be far behind?

The Office Automation Primer is a reasonably successful attempt at helping business executives evolve from word processing into some of the more sophisticated levels of office automation. This is a book that offers a fairly full range of considerations, beginning with various concepts and working its way through to the tools needed to carry out those concepts.

The book reviews various functions of office automation, including word processing, copiers, micrographics, reprographics, message switching, electronic mail, teleconferencing, etc.

The authors then go into a discussion of the "architecture" of office automation and its implementation. Here, the book becomes particularly useful because, among other things, it includes a number of charts and checklists which will help the business executive evaluate the organization's needs and potentials. Again, the authors manage to cover some fairly broad areas, ranging from dealing with personnel to what should be included in a request for bids from vendors.

In an effort to illustrate how principles, philosophies, and concepts apply on a practical, day-to-day basis, the authors provide a number of fictionalized anecdotal scenarios, printed in italics, which gives some sections of the book a kind of *Cosmopolitan* flavor. One entire chapter, entitled "Two Snapshots: An Ordinary Day at the Office," shows the differences in productivity and personal satisfaction among executives and employees in an office that is almost fully automated, as compared to one that is hardly automated at all.

The Office Automation Primer is exactly what the title says it is. While actual and potential hands-on users may gain little that is practical, executives and managers will gain insights into office automation as it will affect their organizations.
—*Marvin Grosswirth*

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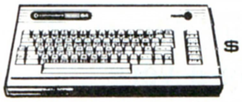

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CIRCLE 184

Why Japanese Computers Aren't Selling in America

For Japanese manufacturers, the American computer market is proving a very tough nut to crack

by Arielle Emmett, Associate Editor

Long ago, when the world was many islands in a sea, Japan fought a fierce war and suffered catastrophic loss when the United States dropped two atomic bombs on Hiroshima and Nagasaki. During postwar recovery, the words "Made in Japan" affixed to cheap toys and export gadgetry came to symbolize junk. In its remoteness, Japan made little impact on the American mind.

Today there is a difference. What Japan does, America watches with awe. A new study broadcast on New York City radio indicates that Japanese children are performing better in mathematics than 99 percent of the American children tested. Japanese kids at the age of four play the violin using the Suzuki method. On the international and American markets, "Made in Japan" symbolizes quality and value: Japanese cars gave Detroit an impetus to clean up its act; Japan knows the zen of electronics-making, of the quality-control circle, wiping out international competition in consumer electronics; Matsushita robots assemble vacuum cleaners in total darkness 24 hours a day; and Japan is emerging as a major player, if not the leading player, in manufacturing technology, ceramic production techniques, genetic engineering, and advanced computer technology, including fifth generation artificial intelligence projects.

What about personal computers? "The personal computer market on one level is a remarkably good market for the Japanese because they have an excellent record in electronics and VCRs," says Michael Young, a technology specialist and associate professor of law at the Center for Japanese Legal Studies at Columbia University. "When you look at the electronics field in general, the Japanese have penetrated that market very successfully," he says, "and one could predict that the Japanese will move into the computer market in a very big way."

But, Young cautions: "The notion that the Japanese are invincible and can penetrate any market is nonsense. The software tends to be unique in personal computing, and there's a language barrier in the software. So far," he says, "it's been easy to capture domestic markets. But the computer market here is very cutthroat, very competitive, and the Japanese don't have a cost advantage in personal computers . . . they've got to convince somebody that they're state-of-the-art and they'll stick around." That may be a tall order to fill in a market as fast-paced and fluctuating as this one, Young suggests.

One thing is clear, though: Japan loves personal computers and Japan uses personal computers. Its "little giant," Sord Computer Corporation, established in 1970 on $3000, according to well-publicized reports, now commands 15 percent of the burgeoning Japanese market, and Sord has attempted twice in the last seven years to launch a successful initiative in the American market. But like more than a dozen major Japanese computer companies, including NEC, Fujitsu, Matsushita, Sanyo, Canon, Epson, and Toshiba, Sord has failed to make inroads thus far, although it, like many others, has once again entered the fray with its M68 and M23 personal computers, as well as making some major investments in American companies.

Whatever the strategy, though, the Japanese have yet to prove themselves as winners in the U.S. personal computing market. Thus far, the Japanese-made and marketed personal computer in America has only garnered roughly 2 percent of the market, according to estimates cited recently in *The Wall Street Journal*, although other industry analysts say the figure may be closer to 5 percent.

Quality we've come to expect

Has anything gone wrong here? Or are the Japanese playing some sort of waiting game? Slow to start, watchful, cautious, mimicking—perhaps—and uncertain about which way the market will go, but ready to dive into the wreck of contenders and come out the winner?

Like the rich, the Japanese are dif-

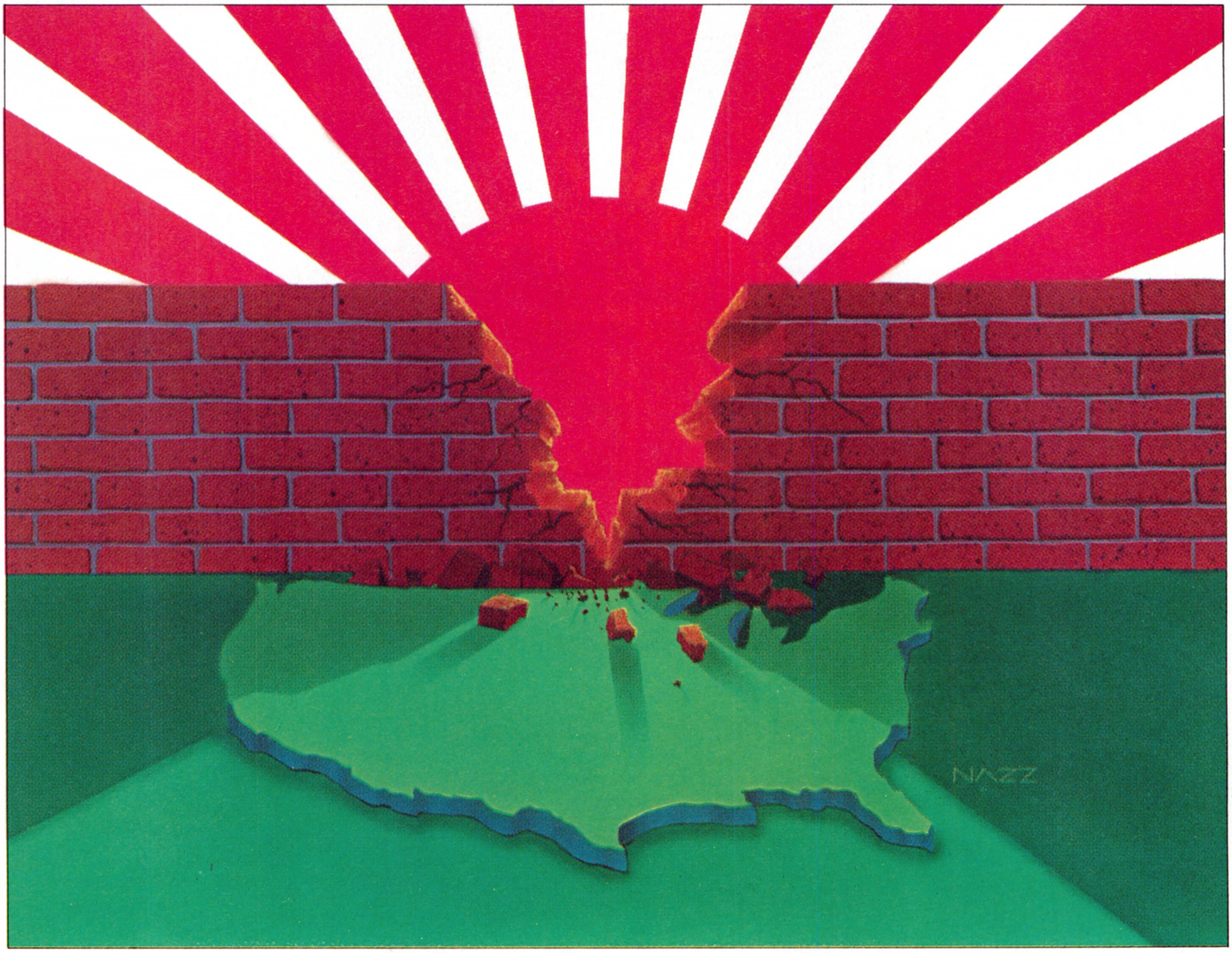
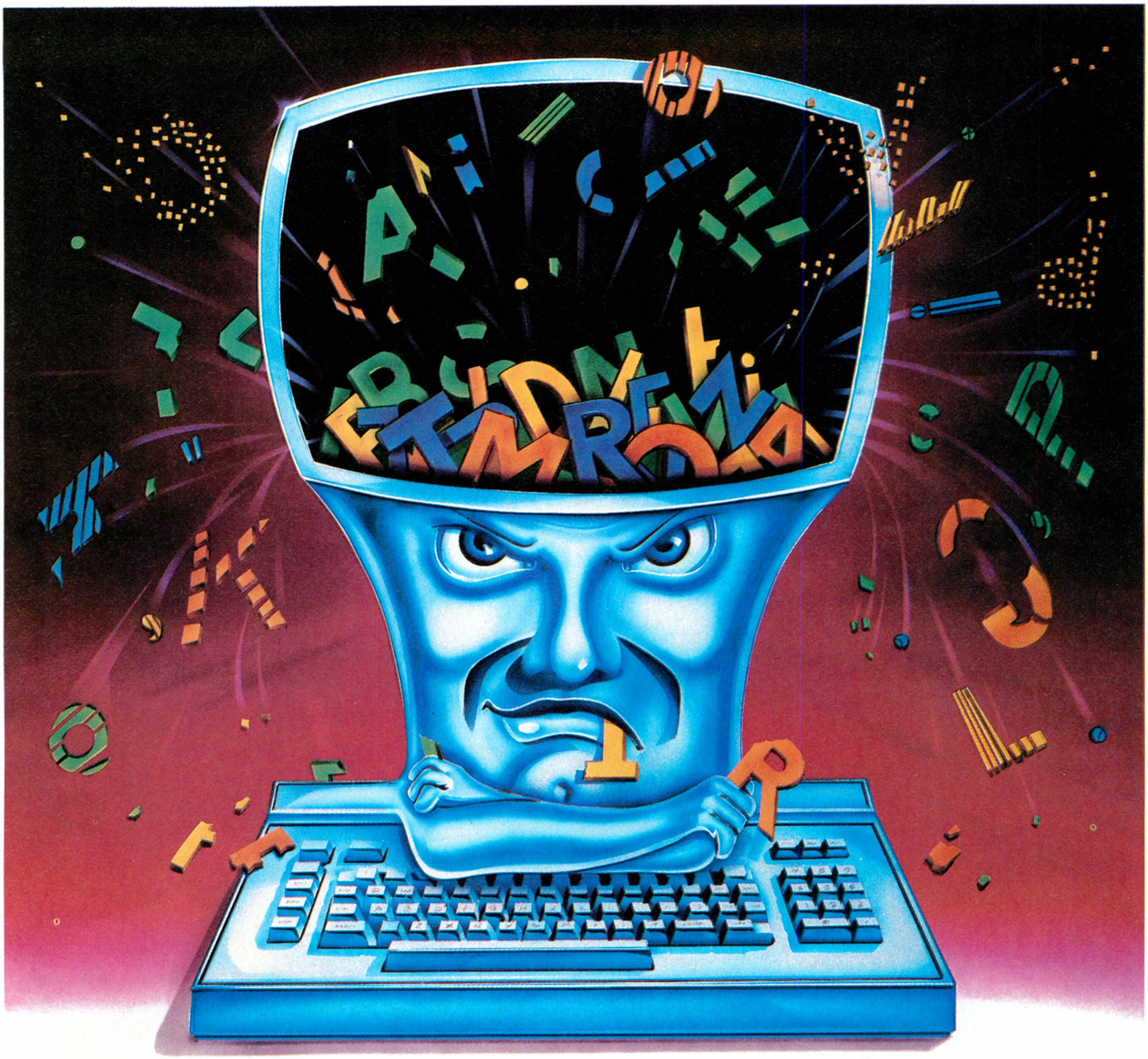


Illustration by James Nazz

ferent. Americans, at least, expect them by reputation to do well in anything they try. But in the American personal-computer market, "Japan Inc." has not waltzed in as expected and shown the American personal-computer industry how to perform up to par. In everything from aggressive pricing strategies and software innovation to marketing technique and distribution, Americans have stayed ahead, thus far, despite an onslaught of 8- and 16-bit Japanese personal computers: machines now capable of dual-language translation (as in the Sord Computer Corporation's M68); of exceptional friendliness (Epson's QX-10); of quality engineering and portability (NEC's 8201 portable and Sharp's PC-5000); of innovative operating languages (Sord's PIPS); a variety of business operating systems (Fujitsu's Micro 16s); and now, IBM software compatibility (Sanyo's MBC 550), the big ticket. It would seem only a matter of time before the Japanese play serious catch-up.

How long that may take, though is anyone's guess. "There are two things in the last 10 years that Americans have taken very near and dear to their hearts," says Tom Priestley, general manager of NEC (Nippon Electric Company) Home Electronics (U.S.A.), Inc. headquartered in Chicago. "One is automobiles and the other is computers. And these are with God, Apple Pie and the White Sox. You don't mess with them." How long will it take Japan to gain a significant market share? Priestley can't predict exactly.

Priestley does say, though, that NEC monitors and printers are doing superbly as is the firm's portable computer, the PC 8201 introduced in 1983, a mere three years after NEC began its personal-computer venture in the U.S. with its first big model, the NEC PC 8000, a machine that has now been succeeded by the PC 8800, an 8-bit personal computer. NEC's PC 8200, the new portable, is already capturing a 25 percent market share, he declares. "You have to build a niche for yourself and then you get strong within that and then you can start growing again," he says. "Can you come in and develop something just for the market when



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CIRCLE 27

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Americans have come to expect the Japanese, by reputation, to do well in anything they try.

you have no dealers, no base, no organized service organization, no training organization? Of course you can't.

"The Japanese are very aggressive marketing people," he continues. "They live in a small country with absolutely no natural resources. So how do you survive in the world? You have to be aggressive and you have to go out."

He reminds me, sitting at a hotel coffee shop and eating his eggs on a dreary Chicago morning, that Japan did not suddenly "invade" the U.S. consumer electronics market, nor did it wipe Detroit off the map in a single shot. He hates the word "invasion," or any other of similar connotation. Instead, he argues, Japan garnered a "presence" gradually, learning from others' mistakes, developing a quality product and selling it at a reasonable price. So it can't, it just can't be long for personal computers even though he believes the Japanese have been "just a half step behind" the Americans in distribution, marketing and advertising, not to mention that bugaboo, software development. (The Japanese are reported only to have available at present about 20 percent of the number of programs available for American machines.)

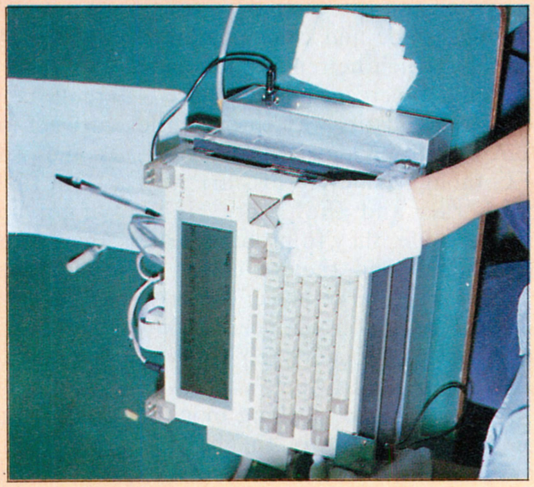
Keeping up with the competition

"We are half a step behind what America is doing," he says, referring to companies like Apple, IBM, and Tandy—the big names. Tandy, incidentally, is competing directly against NEC's 8201 with its Radio Shack TRS-80 Model 100. Both computers were developed by Japan's Kyocera Corporation, so Japan, whether or not American buyers know it, is going head-against-head here. Priestley insists NEC's is the more powerful and versatile computer because of its standard 16k (as opposed to 8k) RAM and the number of programs built into the machine (17 as opposed to Radio Shack's five).

He changes tack:

"Do you know how many cars Japan sold the first year they came to the U.S.?" he asks rhetorically. "Not many. Didn't sell many the second year, third year, or fourth year. It took them over five years to get a presence. The same thing with the radio; the reason that the radios started out well is because they were very inexpensive. But people would throw them away and they were junk. In the 50s, Japan *meant* junk. In the 60s there was a transition. In the 70s and 80s, Japan means quality—bar none. So you can't sit back there and say, hey, everything they did when they walked in was great. That's wrong, that's absolutely wrong."

NEC, after all, didn't do everything right the first time around, Priestley admits. The company tried an exclusive distribution scheme for



Japanese portable computers have gained wider acceptance in the U. S. than personal-computer products. Here, workers at an NEC Corporation manufacturing facility in Japan assemble the popular PC 8200, which is customized and marketed in America through NEC Home Electronics (U.S.A.), Inc.

"*In the 50s, Japan* meant *junk. In the 60s there was a transition. In the 80s, Japan means quality.*"

its personal computers and that failed; there was too much overlapping of turf and the NEC word was not getting out enough to the public. At one point, in fact, two of its U.S. divisions were trying to sell the company's personal computer, a strategy that failed miserably when the divisions fought over the same turf. Priestley says NEC has now opted for non-exclusive distributorships, selling through major computer chains like ComputerLand in addition to retail computer dealers and department stores. This, combined with heavy regional radio and print campaigns, not only in computer magazines but also local newspapers, with names of participating dealerships heavily highlighted, has worked very well, he reports. But what about this half-step behind business?

I ask Priestley again and, in response, he provides a roundabout history of NEC in the personal-computer market. This yarn, spun in Priestley's characteristically digressing way, is at once self-serving and remarkably insightful. It begins with NEC—the first Japanese company to enter the U.S. personal-computer market—which Priestley joined in Chicago in January 1981. Continuing with NEC's success in peripherals and monitors—Priestley mentions the highly touted NEC Spinwriter and the company's range of monochrome and color computer monitors, which he reports now take a roughly 30 percent market share—the story wends its way through the value of add-on devices. After all, NEC thought smartly to start with peripherals and they were right: "Number one, they're probably easier to make and they're easier to bring into the marketplace," he says. "Let Apple tell you you need a computer. Let Commodore tell you you need a computer. In Apple's case, you want to buy a good-looking monitor because ours is really the best; it looks nice; it's an add-on product. Always been easier to sell add-ons," he says. "Look at the industry IBM spawns with the add-ons. Do those other companies create the interest? No. IBM does."

Modified for America

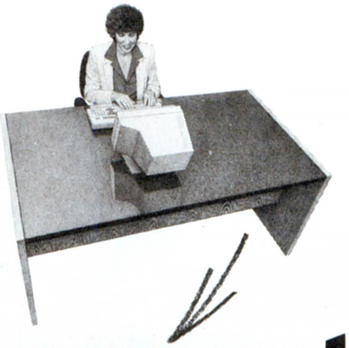
Now comes the clincher: From getting that "presence" in dealerships with the add-ons, NEC tries its first personal computer, the PC 8000, which he describes as a "solid machine," a cassette-driven pathfinder, so to speak, which had to be modified almost immediately to suit American tastes and rapidly evolving hardware requirements—from cassettes to disk drives, for example. "Cosmetics becomes very important," he continues. "Our first one, cosmetically, was sort of an ugly duckling." Despite its quality and reliability, Priestley says, ". . . we had brought a Japanese computer into the American market because they were still in the enthusiast stage; cassette-oriented things were nice; some BASIC was great . . . OK, we brought that product in. Was it a mistake? No, it wasn't a mistake because if you go back to, 'does something work?' we did have the proper software—yes we had a spreadsheet, yes we had a word processor, yes we had the games . . . but then marketing or merchandising became very important and . . . if you follow me, we are half a step behind what America is doing."

Photo by Steve Leonard/Black Star

"Automobiles and computers . . . are two things Americans have taken to heart," says NEC's Tom Priestley.

Priestley doesn't believe that NEC products, if not the whole Japanese personal-computing industry, lack that certain *je ne sais quoi*—a neatness or brilliance in hardware and and software "fit" that could put one or another company into the big time here, scaling some of the big guys down to size. One of Priestley's project directors, Christine Good, acknowledges that a closer fit between the hardware and software is important in opening up the home and business markets. "The key will be products that make sense for home use," she says, especially when home banking and shopping become everyday realities with the computer. But for Priestley, "presence" and "marketing" are still the operative words. For example, finishing his story, he cites NEC's newer entry, the PC 8800, an 8-bit machine with superior BASIC, bundled software and graphics capability, which *could* play catch-up in the market, he says. But when this personal computer was introduced last spring, "American companies, at that time, mainly because of IBM, had moved to the semi-16-bit world. And I say semi because the 8088 (referring to the Intel chip, the 8088, at the heart of IBM and IBM hardware-compatible machines) is not a true 16-bit machine. So what happened when we stood this half-step behind, Americans said: 'Gee, I need a 16-bit machine now.' All right? So we brought out an 8-bit machine. Since then, we've added on a 16-bit option so you've got the best of both worlds . . ." an option that has made the PC8800 a successful entry, though not a blockbuster in any estimation. Can Priestley foresee a major break-

(continued on page 229)



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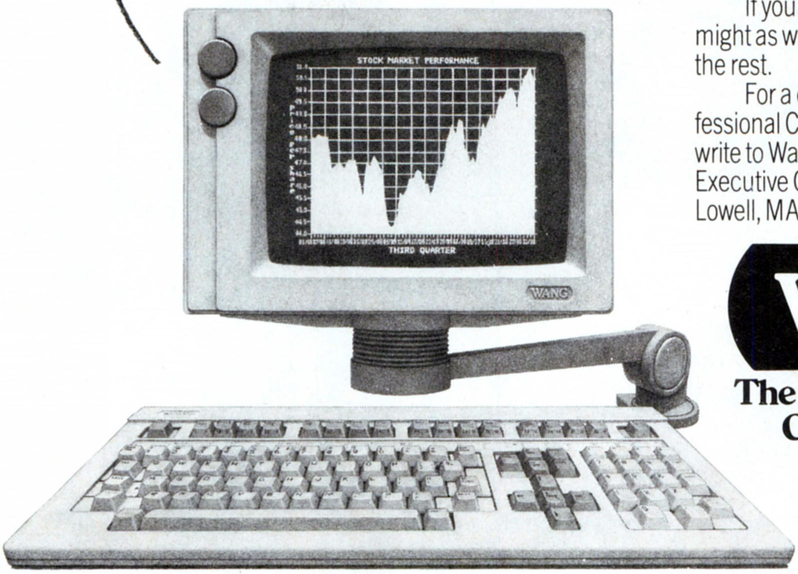

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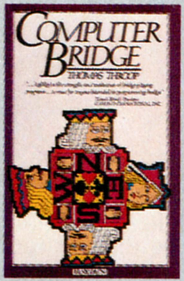

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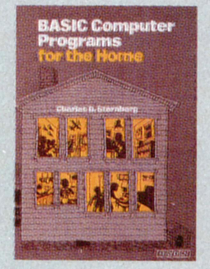

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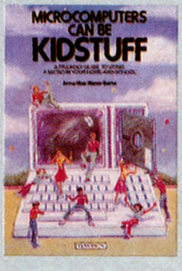

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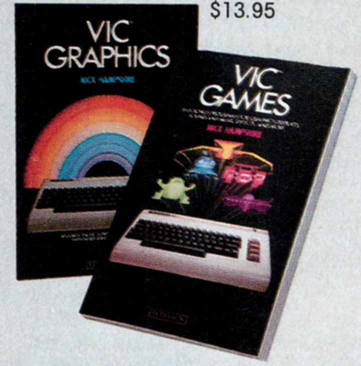

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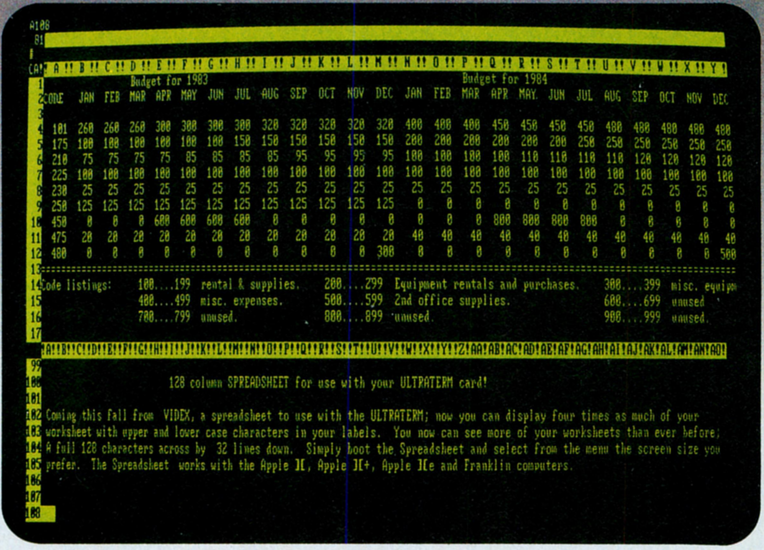

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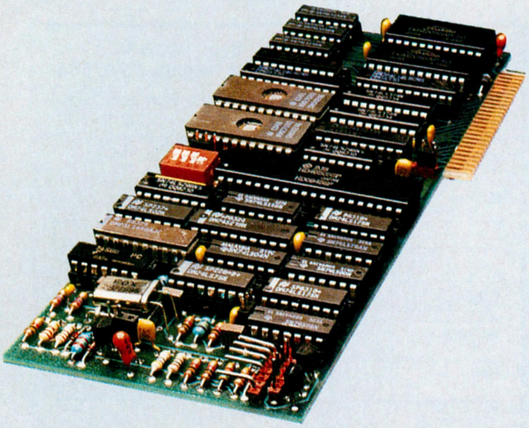

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CIRCLE 36

The Japanese have yet to prove themselves as winners in the U.S. personal-computing market.

(continued from page 224)

through in marketing share here? He says NEC is shooting for 10 percent in the next five years, although, he admits, every self-respecting general manager will say that.

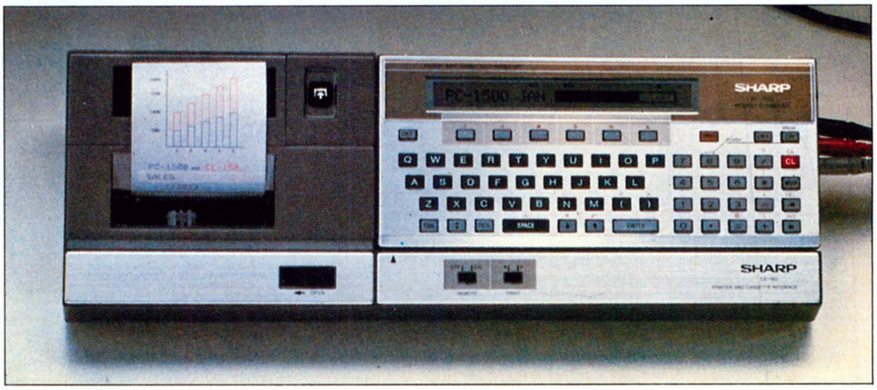
Richard Kors, vice-president of Fujitsu Microelectronics, Inc., Professional Microsystems Division, headquartered in Santa Clara, Calif., expresses enthusiasm, but a bit more caution when prognosticating Fujitsu's future. After all, the company has just introduced its 16-bit machine, the Micro 16S, a computer designed specifically to fit the "thin is beautiful, multiple-operating systems are better" school of American computer design. Scratch that. *Desire*. American personal computer *desire*. Like many other companies, Fujitsu, Japan's number one computer company, had planned to enter the fray two years ago with the FM-8, a model that had sold on the Japanese personal-computer market and had even been previewed in *BYTE* magazine in May 1982.

Fujitsu had contracted Kors to set up a marketing strategy for the computer. Kors remembers that he was supposed to write the business plan without even having seen the computer.

"So I basically wrote the plan without seeing the computer," he says, "just having seen the pictures and specs, and finally they sent me one, and it turned out to be an *old horse*.

"It was big and clumsy, it didn't have anything you'd like as an American—you know, small and movable, and the thing was slow in some real critical areas, like screen refresh performance, and the keyboard had keyboard rollover . . . if you typed fast enough, you could outtype the keyboard. So here is this old horse computer I'm signed up to market. And I'm struggling with the idea of what I'm going to do when they send a message over that they want me to come over to Japan . . . "

Kors went. Knocking heads with top brass, he told them, as politely as he could, that the old horse FM-8 wouldn't make it in the American market. " . . . so the top guy, almost the president of Fujitsu's personal-computer division . . . says he agrees with me, it's an old horse. 'We can't understand why the computer is selling so well in Japan,' he said. Well, I explained, it's sort of the IBM phenomenon, you're Fujitsu—anything Fujitsu makes people will buy for a while, but when they find out it's not a high-performance machine, they'll stop buying one, and sales will go down. They said, 'Terrific, thank you,' and sent me home."



Sharp Electronics Corporation comes on strong in portable and pocket models. PC-1500 shown here features mini-graphics and high speed, C-MOS 8-bit CPU.

Reinventing the computer

Two months later, though, Kors got another call from Japan. Sales were down, just as he said, and Fujitsu was killing the FM-8 for the American market. Instead, they hired Kors to make a total critique—work with the design boys and managers to come up with a new computer. The result was Micro 16S, a sleek piece of machinery that incorporates three operating systems—MS-DOS, PC-DOS, and something known as concurrent CP/M, which is a CP/M that will allow the computer to do more than one thing at once, and operates programs both in CP/M 86 and CP/M 80. The advantage of this is that you can run CP/M programs that were written as early as 1975. The machine also comes equipped with two microprocessors: Z80A and the 8086 CPU, which are plugged into the computer on a plug-in board rather than on a motherboard. The versatility of the design should be obvious, but as Kors explains it: "Whether it's the 8086 or the 68000 (an option is available for this microprocessor, also) you can plug that into the machine and it gives you great expansion capability . . . as new processors become available, you'll be able to plug them in, too." The multiplicity of processors allows Fujitsu's entry to run a great deal of business software, and at $4000, as compared to the IBM Personal Computer's retail price of around $2800, it ought to. Equipped with standard features that are optional on the IBM (e.g., the parallel printer card, serial communications and video graphics are built right into the Micro 16S motherboard), the Micro 16S is clearly part of a strategy many Japanese companies must aim for sooner or later: carving out a unique niche by *offering* something unique. For Kors, this means overturning or at least repacing marketing strategies to compete in the American fast lane.

"The Japanese way is to move a little bit, see how it goes; move a little bit, see how it goes. What we're

(continued on page 233)

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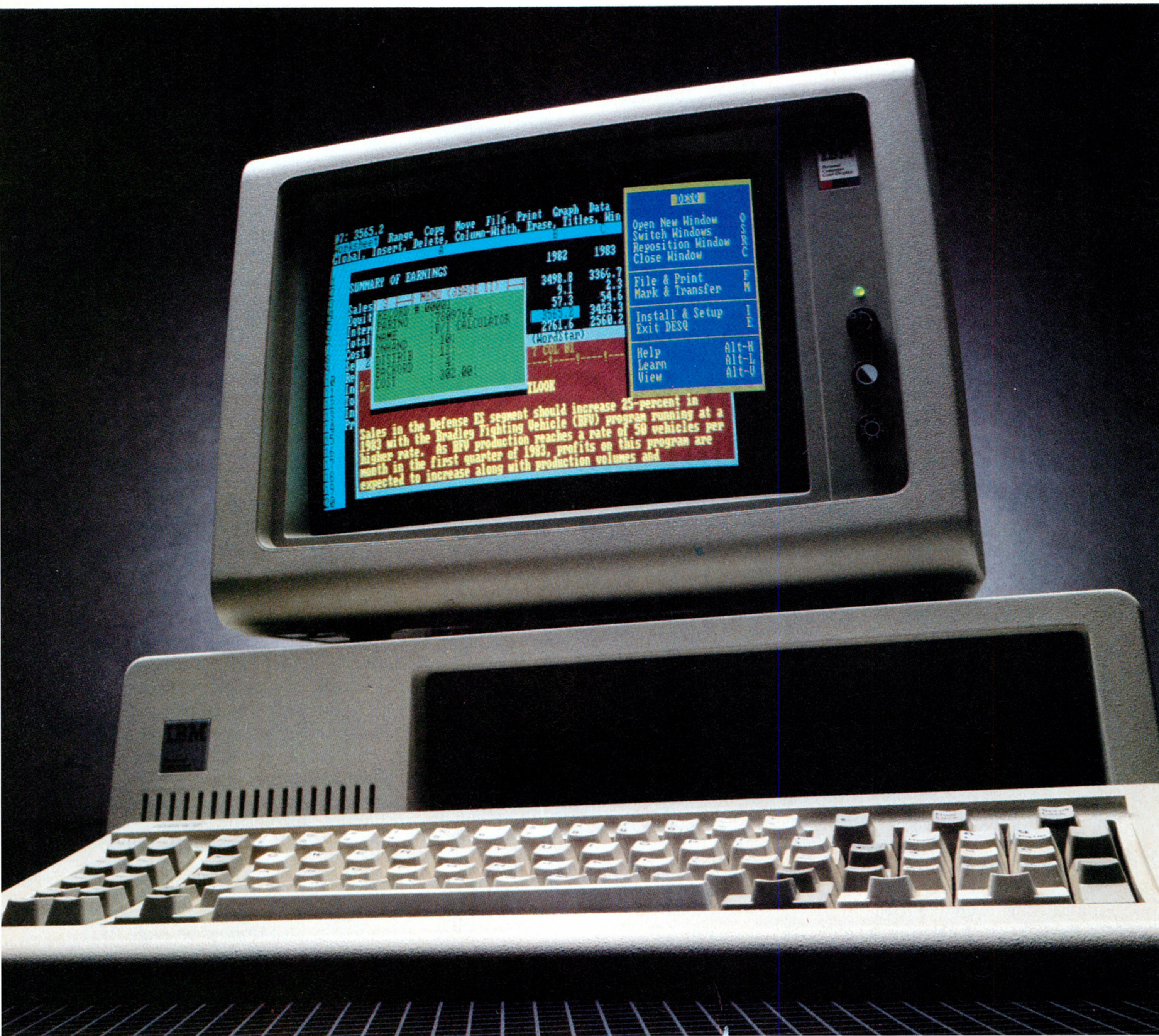

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CIRCLE 203

Japanese personal-computing companies may be in trouble because their names are not familiar to Americans.

(continued from page 229)

seeing from other Japanese companies is that they're still in an incremental engineering mode; they're not trying to get ahead.

"But in the personal-computer market, that has two problems: The market is moving faster than a little bit, and the second thing is that to market a computer requires what I call a *critical mass*." He smiles, hunching over now, gesturing with opened arms.

"You can't just send one guy over here and have him start marketing a computer," he goes on. "You need to do this and that. I told Fujitsu we needed 100 people in the U.S. and $4 or $5 million dollars for advertising, and if they weren't willing to make that commitment, they probably shouldn't do it. But for certain I didn't want to be associated with it because I thought it would fail."

Kors laughs. He got 80 people and $4 million. The figures are something akin to *compromised* critical mass. There is a saying: "You can't be a little bit pregnant." But in any event, he and Fujitsu came to an understanding.

No known formula for success

"The other thing is—" Kors pauses here, searching. "The Japanese word is *Kada*. It means 'the form.' The Japanese culture is dependent on copying, like when kids are taught in school. There is no success formula for entering the personal-computer market in the U.S.: Apple did it in its own way; Tandy did it another way; IBM, Commodore in another. You can't say: 'This is the way to do it.' There's no formula. And by the same token no American has been successful in Japan because there's no known way to succeed in Japan." IBM, Tandy, and Apple have tried.

"Why are we being dominated by three of four companies controlling 80 percent of the computer market?" he asks. "That's the macro question . . . why? I don't know exactly. People haven't found a better way . . . IBM came in and overwhelmed everybody; maybe it's because the market is fragmented," he says, "there's not enough critical mass for somebody to get something going."

Fujitsu, for one, is trying, and already their product has won some minor victories including a major state government agreement to purchase a couple of thousand computers, and early positive results in sales. Kors is handling distribution with great care, setting up strict criteria for training at the Fujitsu home office in Santa Clara; directing sales to very large end users, and building long-term client relationships. "That's basically how IBM did it," he says. "Apple did it with regional distributors in the beginning; and if you recall, they saw the light and got rid of regional distributors."

Regional distributors as bad guys

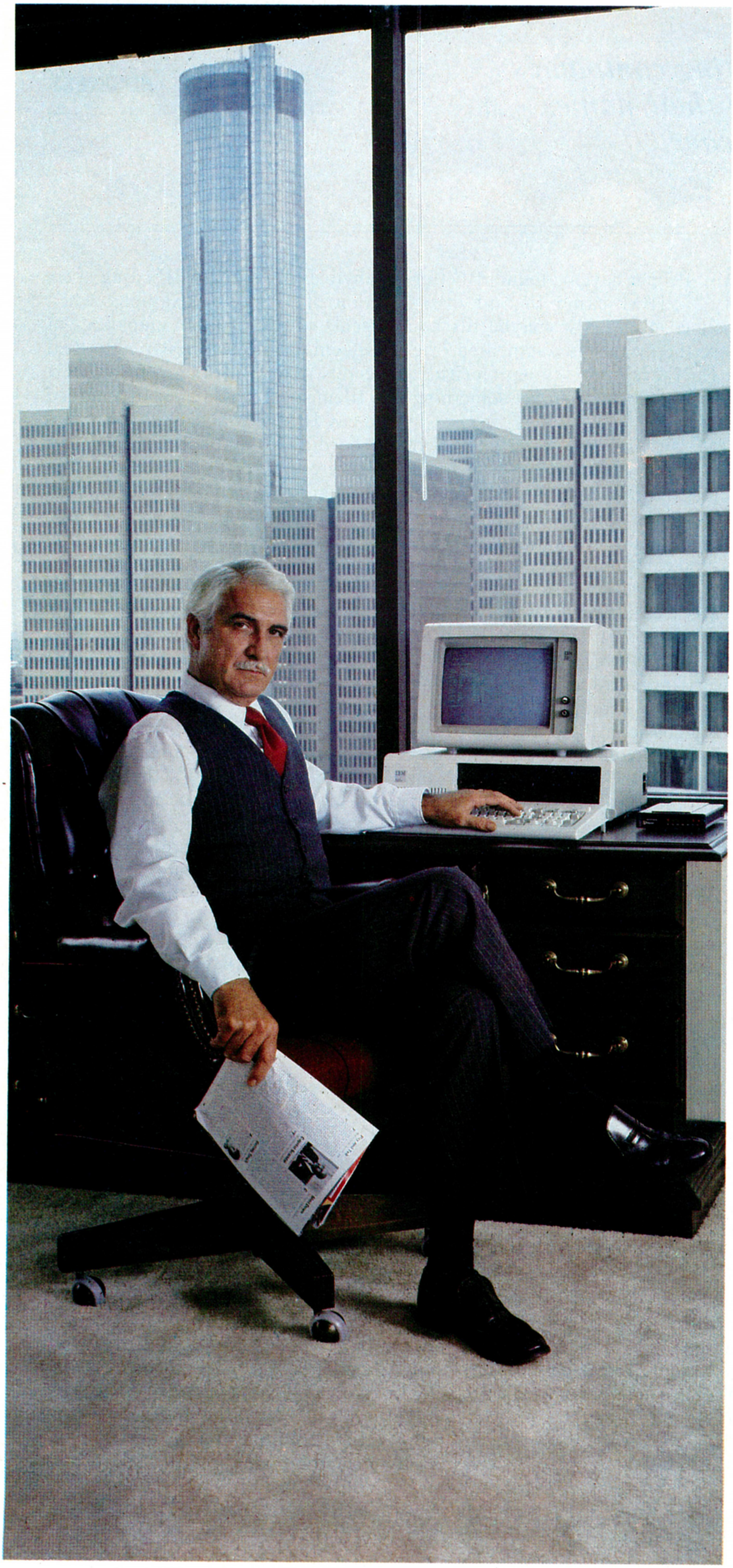
"Regional distributors are supposed to train people," says Kors. "But these guys were in it for the money; they didn't care about long-term markets, they just wanted to sell. Well it was very easy to get into the market quickly and very cheaply. But as soon as another hot product came along, you were dead . . . you had no communication, and it was like pushing stuff off into a black hole."

Whether distribution is the black hole, or the critical mass, or the garbage can for all Japanese desires, a still more powerful force tearing away at everybody is IBM. This computer giant is both standard and substrate of Kors's conversations; machine and company by which Fujitsu and all others come to measure themselves and to be measured. With astronomical increases in sales, nearly a 30 percent market share in personal computers, and the new PCjr, IBM seems virtually unstoppable, so much so that even Japanese trade experts seem to fear it. If anything, that fear has taken tangible forms: the FBI's sting operation of 1982, for example, when agents caught a dozen employees of Hitachi, Ltd. when they tried to steal secrets from IBM. In an out-of-court settlement, Hitachi recently agreed to pay IBM as much as $300 million, according to published reports, a figure estimated to be nearly half of Hitachi's expected profits for this fiscal year. IBM had also been granted leave to inspect future products from Hitachi.

"My impression is that IBM has enormous power as compared with Japanese companies," remarks Masutaro Urata, a research associate in the U.S.-Japan Relations Program at the Center for International Affairs at Harvard University. Urata has also worked for Japan's governing trade body, MITI, the Ministry for International Trade and Industry.

"I'm not that optimistic about personal computers competing with IBM," says Urata. Before the Justice Department tried to break up IBM between 1969 and 1982, he says, the U.S. market seemed, at least, more competitive and open to new challengers. "But after the divestiture decision was lost, that's when IBM became very strong," he says. So strong, in fact, that only a massive effort on the scale of a mythologized government/corporate offensive—a real Japan Inc.—would overturn it. But that is extremely unlikely given the Japanese climate of government laissez-faire toward the personal-computing sector, a sector considered strictly commercial, "third generation," and thus low priority as compared with "targeted" industries like semiconductors and mainframe artificial intelligence technologies.

"There is no government policy for the personal computer," confirms Hideyuki Hayashi, director of industrial electronics at the Japan Trade Center in Manhattan. He acknowledges, however, that Japanese personal-computing companies may be in trouble because "most Americans



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CIRCLE 126

> ***"The Japanese have been loath to enter the U.S. market until they had a software system that would meet American needs."***

don't know Japanese manufacturers' names." Witness NEC Home Electronics (U.S.A.), Inc. Most Americans don't even know that NEC is a Japanese corporation; most Americans, unless they've been in heavily targeted advertising areas, don't even recognize the name NEC, according to Priestley, a point Hideyuki Hayashi emphasizes also. "I don't think the Japanese will gain a large market share in personal computers. They're just getting started," he concludes.

"Japan Inc?" scoffed Hiroaki Sato, associate director of research at the same Japan Trade Center, a partly government subsidized trading body. "I have not seen a single Japanese who approves of that concept," he says of the concept first formulated by U.S. Department of Commerce analysts 10 years ago. "In the past three or four years, arguments have been advanced within this country saying that Japan is not a monolithic operative. In its place, the idea of 'industrial policy,' has been gaining much popularity . . . years ago, the Commerce Department wanted to explain why Japan was so successful; it became a catchword . . . but 'Japan Inc.' is a bunch of bunk."

Americans intimidated

Ironically, NEC's Tom Priestley does not think Japan Inc. is a bunch of bunk. To him, the term may not describe a reality, but it does very accurately describe the American attitude toward Japan, an attitude recently explored in a landmark survey conducted by the New York firm, Yankelovich, Skelly and White, Inc., for Motorola, Inc. The survey, entitled "Meeting Japan's Challenge: The Need for Leadership," conveys the same message as Priestley: Americans, even the majority of the top leaders in business and government, are intimidated by Japanese accomplishment in marketing and industry; and most, concurrently, are not confident America can do anything productive to "stop it," if indeed "stop" is the right term. More than 80 percent polled in the survey affirmed the importance of "addressing" the Japanese challenge, while an even greater percentage felt that it would require "a great effort" on the part of U.S. industry to become more competitive with Japan. At the same time, however, a so-called "psychology of self-effacement," even defeatism toward America's combative efforts, was also strongly manifested among those polled.

"There is a Japan Inc.," Priestley says, "but all the Japanese companies are very competitive." How does he define the term? "I think it is more in the American mind. There is also an America, Inc. I don't like it because it sounds like there is . . . " But he trails off here, once again emphasizing that the real competition is not other Japanese companies in the American market, but the "biggies" again.

Americans have an inferiority complex, he says. "Why? I don't understand it! If we're talking technology, America is more advanced than any other country. This is the greatest country in the world. Period. But when we get to business—remember what I said earlier? There are two things other than God, Apple Pie, and the White Sox, and that's computers (and cars) . . . Right now, this very second, our (American) technology is superior to anybody's. But the problem is on the manufacturing level. How do you overcome that? From the 1860s to 1910, when America became somebody, we did it on expansion and manufacturing, but *guess what we can't do now?"*

Priestley and I almost gloat in his cleverness. I don't answer. I go back to IBM.

"What's the best *known* personal computer?" I ask him.

"It's IBM", he says. "Ask any hardware person. Is it the best machine out there? Good God no. No. It's merchandising . . . soap is soap is soap . . . "

Soap or no, it is there: the company and the computer. To combat it, or at least to shear off some earnings for themselves, many Japanese companies have adopted a strategy of incorporating in their computers the popular Intel microprocessor, or control chip, the same chip used in the IBM, a strategy Priestley predicts will come to no good in the end, but for now allows the Japanese machines to use much of the IBM software.

Software: the U.S. success story

According to Tim Miles, an industry specialist in the Bureau of Industrial Economics, U.S. Department of Commerce, software is still the key; and the Japanese will need to play a quick game of leapfrog to catch up. "In the last year the Japanese have gone to U.S. software houses to come up with software products for their personal-computer exports," he says. "And they're going to be marketing machines with U.S. software." The extent of the software gap, until now, has been appreciable: As mentioned earlier, one estimate noted that Japan's software inventory was only around 20 percent of America's. Besides that, the Japanese have had the additional problem of reconfiguring software and even hardware so that it displays in the appropriate language. For example, the complex Japanese character set features thousands of Chinese characters (called Kanji) in addition to the Japanese syllabary called the katagana; a Japanese personal computer would require at least one extra row of keys in order to accommodate the graphics capability needed to produce the katagana. For the American market, though, the keyboard would have to be redesigned and made simpler. In terms of software, early programs developed for Japanese computers sold in America often displayed Japanese in addition to English, a characteristic

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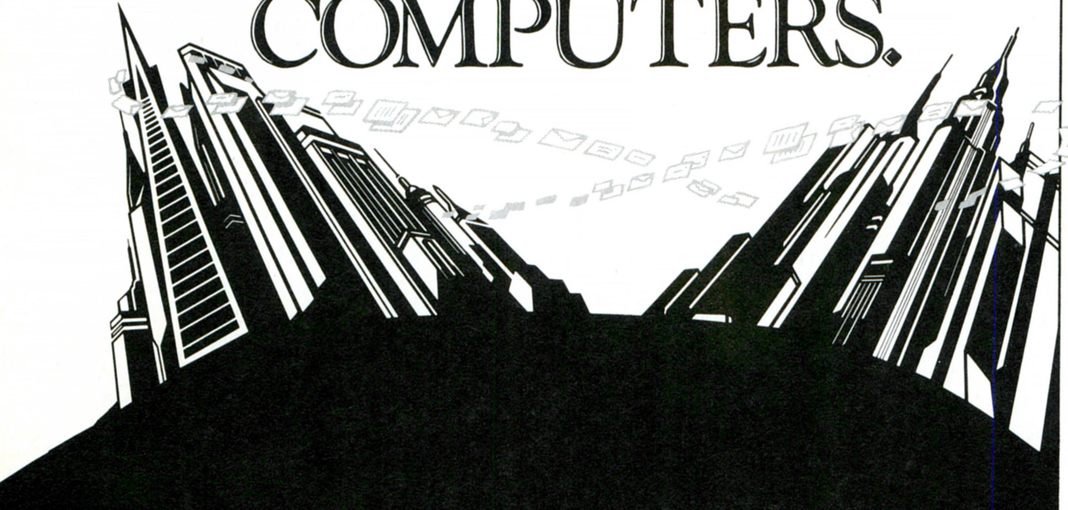

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CIRCLE 101

Japanese companies must carve out a unique niche by offering something unique.

which might have seemed intimidating to the American consumer.

One computer company that is capitalizing on its bilingual capabilities, however, is Sord Computer of America, Inc. Once again venturing into the U.S. market after two unsuccessful tries, Sord, a $100 million a year company and one of Japan's fastest growing, is making a big market thrust toward American corporations needing bilingual computer capability. "Sord speaks Japanese and English simultaneously (on the personal computer)," declares George Gilbert, a publicist for the company. Sord's personal computers have already been placed in Japan Airlines and Mitsui (U.S.A.) Inc., Gilbert says. Sord is now busily marketing its wares—the M23 compact desk-top system with graphics and data communications, the M343 markX, a hard disk 16-bit system and the highly publicized M68 personal computer, an 8-/16-bit computer which uses a Motorola MC68000 microprocessor in addition to Sord's proprietary integrated software system known as PIPS (Pan Information Processing System). A highly popular system developed in Japan, PIPS provides up to 95 percent of the software necessary for business operations on a personal computer, Sord claims. One disadvantage that glares, though: PIPS matches no other integrated system. If that really can't be gotten around, though, Sord has developed other strategies that should make their computers attractive in the U.S. market. For example, Sord's president, Takayoshi Shiina, has already invested heavily in a U.S. firm, the Charles River Data Systems, Inc., a Natick, Massachusetts-based company that will manufacture for Sord some of its most advanced hardware. Simultaneous deals are being worked out to invest in at least one California-based American software house. And Sord is shoring up distribution with dealers in major U.S. cities, claiming that its home office (in Torrance, Calif.) and branches have helped achieve a 30 percent coverage of the industrial and business markets in this country.

Sord's vision and aggressive strategies mark it as a company worth watching, especially as the American personal-computer market matures. If anything, say the experts, Japanese companies do much better in maturing, if not a mature market; they are less good at making beginnings. They are *very good* at shaking things up once a market shows signs of stasis, even decay. A prime example is Detroit.

Learning from others' mistakes

Because Japan tends to benefit from the mistakes of others, it has gained its reputation as an "enhancer," an improver of consumer products. By the same token, many companies contemplating heavy foreign investment have tended to be watchful; they do not throw their money around. "The Japanese have been loath to enter the U.S. market until they had a software system that would meet American needs," says Sord's George Gilbert, "and they've been slow to develop that system." Also, Gilbert says, Japanese companies have not wanted to repeat the mistakes of Texas Instruments in the home market. So they've held back. An example is Sanyo Business Computer Systems, which had planned to market a home computer known as the PHC 20 series in the U.S., but pulled the machine out before it even hit the dealer shelves, according to Ron Milos, marketing manager for Sanyo.

"We had a lot of trouble with that one," Milos recalls, and there were already advance press reports of the computer published in *Business Week*. The home computer was "nice," he reports, but not unique. The dilemma forced Sanyo, as it has other Japanese companies, to turn away from the low end and aim for the personal business computer market, where solid, long-term gains are likely to be made. NEC's Tom Priestley asserts the Japanese are willing to do this because they're not in it for a quick kill. But will they take a loss just to stay in?

"There's a difference," Priestley cautions, "between being willing to take a loss and being willing not to take a large profit, but to reinvest and reinvest and reinvest . . . .Maybe we should do that in America," he says. Better to aim for slow, steady growth than to fall, like toy soldiers, by the wayside.

Today, Japanese companies in America are aiming, ultimately, for big growth. But each is working out its success formula in a different way, as I found out by contacting a number of Japanese computer companies marketing in the U.S. (Not every company responded to our queries, and the summaries below do not aim to represent any and every Japanese entry on the market.)

Finding the key to success

At Sanyo Business Systems Corporation, for instance, the way is clearly IBM software compatibility. Sanyo has come up with a machine they proclaim will run about 85 percent of the software the IBM Personal Computer will run—except for the graphics packages. That computer, the MBC 550, a 16-bit, MS-DOS machine, has already sold 25,000 units at less than $1000 dollars a unit in the first three shipments, according to Sanyo's marketing support specialists. "We'd like to gain a 10 percent market share," enthuses Ron Milos. "And as with everyone else, we're going to be chipping away at the IBM market," as well as the CP/M-based market, he reports. Sales of the MBC 550 have been so strong in recent months that the computer has overshadowed attention given to other Sanyo personal business computers: the MBC 1100, 1200, and 4000 series for instance—computers which are based in CP/M

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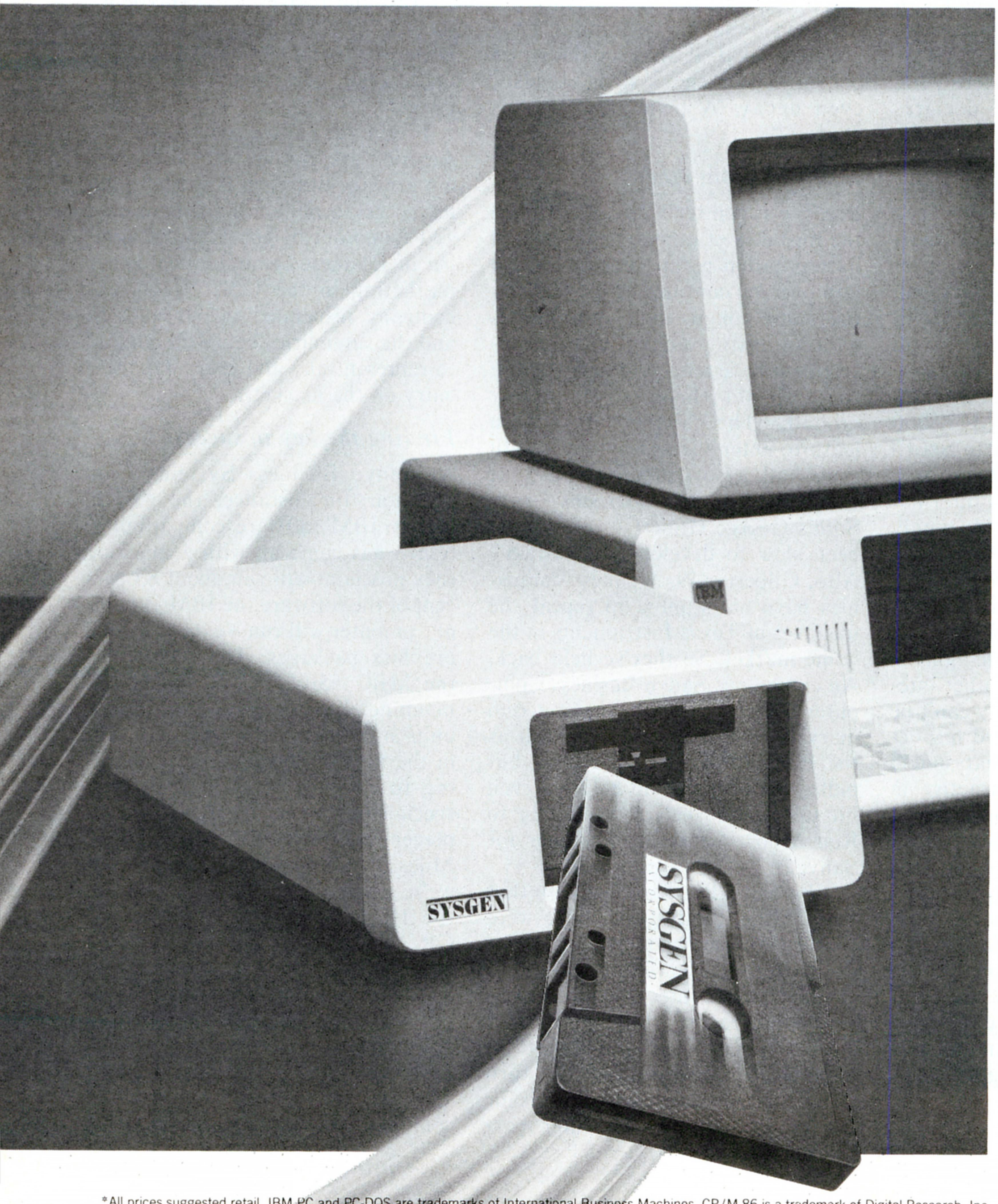

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CIRCLE 121

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Today, Japanese companies in America are aiming, ultimately, for big growth.

80 and CP/M 86. (An MBC 4050, a 16-bit 128k machine, for example, sells at $2699.) Milos remains confident that the hubbub over MBC 550 will pave the way for all of Sanyo's computer line.

Dr. Sorel Reisman, manager of systems marketing for Toshiba America, Inc., Information Systems Division, in Tustin, Calif., isn't convinced that IBM software compatibility is all it's cracked up to be. Instead, he argues that his own company's personal computers—the T100, an 8-bit compact model, and the 16-bit T300, a personal business computer equipped with the 8088 Intel Chip—offer something more: exceptional manufacturing quality, superior documentation and high-level applications software that is "leading the way.

"I can't comment for other companies," Dr. Reisman says, "but Toshiba has been a competing company in Japan, mainly with mid-size computers. We were the first company to offer Japanese word processing . . . . In two years, we've done remarkably well in the U.S., developing products for distribution, and ancillary relationships with software vendors."

Sharp, Canon and Epson are each developing separate ways of coping with the market. Epson America Inc., for example, which brought out the highly-touted QX-10, a machine heavily promoted for its exceptional friendliness, has acknowledged that the slow speed of the machine may have discouraged buyers and has taken steps to correct that. According to Walt McIntyre, national sales manager for the Computer Products Division: "We have recognized the need to improve the speed and we've made a number of advances . . . in the Valdocs 1.18 operating system." Like many other Japanese computer systems, the Epson line just hasn't had enough software, McIntyre reports, but the company again is speeding its software acquisition, even as it continues to rely heavily on sales of its printers, which account for 50 percent of the world market.

At Canon, U.S.A., Inc., notes national sales manager for Systems Division, John Moore, the strategy is clearly to build the personal computer base as part of an overall system of office automation products. The Canon AS-100 personal computer, for example, a 16-bit system using an 8088 chip, is but one of a broad product range including high quality ink-jet and laser printers. "The computers are a small portion of our business," Moore admits, "but Canon has plans to continue . . . . As the computer shakeout takes place in the U.S., the buyer will be looking for financially sound companies with a quality product."

Perhaps there is no more intriguing prospect for the industry today than Sharp Electronics Corporation's new computer series. The company makes the PC-5000, a 12-pound portable computer with 64k ROM, 128k RAM, a 16-bit 8088 processor and full-dot, liquid-crystal display. With its optional thermal printer, the PC-5000 is one of a series of powerful devices geared toward the mobile public, according to Sharp spokesman Don Mohr. At $1995 the hand-held PC-5000 "is doing tremendously," Mohr enthuses, exceeding sales projections since the computer premiered at NCC in 1982. Still more intriguing, though, is a Sharp invention—computer, home entertainment center, videotape analyzer and hard copy port all combined—which is marketed, thus far, only in Japan. Called the X-1, this computer is reported to have a superb high-resolution color monitor for ordinary television transmission, a CPU, keyboard, 64k of memory, a CP/M operating system and programs on floppies and diskettes. According to Sharp officials, the monitor is capable of superimposing fine computer-generated graphics into the visual circuitry, so that the computer, for example, can extract a freeze-frame taken from a videotape machine connected as a peripheral, then create on top of the freeze-frame a model graphic form. The X-1 is also capable of producing a transparency (like a slide) of its video images. Although Sharp says it has no plans to market the X-1 in the U.S., the device does seem precisely the kind that could give *any* competing Japanese company a leading edge. If not the device, then the inventiveness it speaks to. Think, for example, what a device like the X-1 could do in a hospital setting, for instructional purposes and during precision surgery. Physicians could use both the visual information from videotape freeze-frames as well as the corrective graphic feedback a computer provides, superimposing its measurements and pictures (developed from data the physician inputs) on top of the video. That's one possible application. But there could be millions of others. Whatever the application, the X-1 and products like it may signal that quality of "foresight," in Richard Kors's words, that must and will be the byword of the American computing industry of the future.

"Foresight is . . . what is going to be in the computer that's here next summer," Kors says. "The computer . . . you can't make today because the technology isn't there," but the vision is.

NEC's Tom Priestley identifies the quality a different way. "You've got to stand on your own. You've got to be your own person. If you just follow and copy . . . you're going to have a lot of unemployed people.

"We've proven ourselves," he concludes. "We understood how people worked; we showed we could set up a good distribution arm that's retail oriented . . . and we showed strength and promise; we were allowed to get more input into the product.

"As a company, you can come in and say anything you want, but if you have never proven yourself . . . who cares what you've just said?"

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Softwaire Centre International/Concord	(415) 674-0222
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Softwaire Centre International/Oakland	(415) 428-9333
Sorbus Station/San Leandro	(415) 483-9862
The Software Guild/Union City	(415) 487-5900
The Software Shop/Burlingame	(415) 340-7115
Stacey's Bookstore/San Francisco	(415) 326-0681
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The Xerox Store/Palo Alto	(415) 324-8200
Track Computer Center/Oakland	(415) 444-8725
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Softwaire Centre/La Mesa	(619) 462-3900
Software Only/San Diego	(619) 569-1666
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Santa Rosa Computer Ctr.	(707) 528-6480
The Software Place/Fairfield	(707) 427-2104
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Advanced Computer Prods./Santa Ana	(714) 558-8813
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The Xerox Store/San Bernadino	(714) 889-9511
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Charlie Apple Software/Ventura	(805) 644-0799
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Computerland/San Luis Obispo	(805) 541-4884
Computerland Santa Clarita/Newhall	(805) 254-3121
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9	34	59	84	109	134	159	184	209	234	259	284	309	334	359	384	409	434	459	484
10	35	60	85	110	135	160	185	210	235	260	285	310	335	360	385	410	435	460	485
11	36	61	86	111	136	161	186	211	236	261	286	311	336	361	386	411	436	461	486
12	37	62	87	112	137	162	187	212	237	262	287	312	337	362	387	412	437	462	487
13	38	63	88	113	138	163	188	213	238	263	288	313	338	363	388	413	438	463	488
14	39	64	89	114	139	164	189	214	239	264	289	314	339	364	389	414	439	464	489
15	40	65	90	115	140	165	190	215	240	265	290	315	340	365	390	415	440	465	490
16	41	66	91	116	141	166	191	216	241	266	291	316	341	366	391	416	441	466	491
17	42	67	92	117	142	167	192	217	242	267	292	317	342	367	392	417	442	467	492
18	43	68	93	118	143	168	193	218	243	268	293	318	343	368	393	418	443	468	493
19	44	69	94	119	144	169	194	219	244	269	294	319	344	369	394	419	444	469	494
20	45	70	95	120	145	170	195	220	245	270	295	320	345	370	395	420	445	470	495
21	46	71	96	121	146	171	196	221	246	271	296	321	346	371	396	421	446	471	496
22	47	72	97	122	147	172	197	222	247	272	297	322	347	372	397	422	447	472	497
23	48	73	98	123	148	173	198	223	248	273	298	323	348	373	398	423	448	473	498
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Computerland/Durango	(303) 385-4848
Computers, Inc./Englewood	(303) 779-5256
Micro World Electronics/Lakewood	To Come
Programs Unlimited/Lakewood	(303) 234-1995
Toys 'R' Us/ All Stores	
Whole Life Distributor/Denver	(303) 861-2825
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Computer Center/Pearl City	(808) 448-2171
Computerland/Hawaii/Honolulu	(808) 521-8002
The Computer Store/Hilo	(808) 969-1166
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Electronic Specialties/Boise	(208) 376-5040
Friendly Computers/Coeur D'Alene	(208) 667-4513
Magnum Computer/Boise	(208) 342-7304
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Amateur Radio Equip./Wichita	(316) 264-9166
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Computerland/Wichita	(316) 684-3870
High Technology/Wichita	(316) 262-0315
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Computer Tree/Kearney	(308) 234-2566
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Computerland/Omaha	(402) 391-6716
Electronic Center/Lincoln	(402) 476-7331
M & A Computer Services, Inc./Hastings	(402) 462-9545
Sunshine Computer & Software Center/Hastings	(402) 462-5300
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ADX Computers/Las Vegas	(702) 871-5105
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Computer Central/Las Cruces	(505) 524-2955
Computer Shop/Clovis	(505) 762-3327
Computerland/Santa Fe	(505) 988-8800
Computer Superstore/Albuquerque	(505) 293-5370
Omega's Computer Connections/ Albuquerque	(505) 298-5400
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Computer Superstore/Richardson	(214) 690-6404
Computer Video Sys./Plano	(214) 423-3654
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Fulton Business Systems/Dallas	(214) 934-0031
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Mr. Micro, Inc/Dallas	
Marketland/Richardson	(214) 680-2820
The Program Place/Dallas	(214) 369-1911
Simtec/Dallas	(214) 484-3319
Software Access/Irving	(214) 255-5615
Software Concepts/Dallas	(214) 458-0330
Softwares/Dallas	(214) 644-5043
Software Centre, Intl./Dallas	(214) 991-3169
The Software Store	(214) 234-8059
Strictly Software/Dallas	(214) 392-3030
U.S. Software/Dallas	(214) 357-7800
The Xerox Store/Dallas Prestonwood	(214) 385-7235
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Computer To-Go/Austin	(512) 472-8926
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Computers Plus/San Antonio	(512) 532-2042
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Computerland Houston Bay/Houston	(713) 488-8153
Computerland of Houston/Westchase	(713) 558-1200
Computerland/Westwood	(713) 270-1200
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M-6 Distributing/Houston	(713) 530-3363
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Software Station/Houston	(713) 783-5935
Software Station/Houston	(713) 783-5934
Waghalter Books/Houston	(713) 627-9970
Westheimer Newstand/Houston	(713) 781-7793
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Agriplex Computers/Lubbock	(806) 797-4495
A To Z Computer/Wichita Falls	(817) 322-1007
Computerland/Wichita Falls/Wichita Falls	(817) 691-7670
Computerland/Waco	(817) 776-6700
Computerland/Wichita Falls	(817) 761-1103
Computer Pro/Ft. Worth	(817) 654-3360
Computer Vision/Arlington	(817) 274-6608
Computer Tech Assoc./El Paso	(915) 533-2108
Computer Technology Assoc./Midland	(915) 699-5046
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Mnemonics Computer Store/El Paso	(915) 778-2708
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Computer City/Ogden	(801) 627-2489
Computerland/Orem	(801) 224-2608
Personal Business Computers/ Cedar City	(801) 586-2648
Quality Technology/Salt Lake City	(801) 521-5040
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Computerland of Casper	(307) 234-3879
Toys 'R' Us/All Stores	
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CIRCLE 3

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SYSTEMS

DIMENSION 68000 PROFESSIONAL PERSONAL COMPUTER

Compatibility is the key word for this new system from Micro Craft Corporation. The Dimension 68000 can handle Apple, IBM, KayPro, and other CP/M-based software. Micro Craft says its product will also be able to handle TRS-80, UNIX, Osborne, and Cromemco software by early 1984.

With the Dimension 68000, Micro Craft aims to emulate virtually any popular microcomputer and software combination from 8-, 16-, or 32-bit machines. All you'll need do is enter the name of the system you want to emulate, and Dimension will configure to the proper format.

Because of its 32-bit MC68000 microprocessor, the Dimension 68000 is very powerful, storing up to 16Mbytes of main memory. Micro Craft plans further development of the Dimension 68000's memory. By early 1984, this system will offer up to 50Mbytes of hard disk storage.

With its large memory and its compatibility features, the Dimension 68000 ought to be ideal for business uses, according to Micro Craft. Mike Carpenter, president of the company, says the Dimension 68000 also has engineering and scientific uses. "In addition to a 16Mbyte memory capacity, it can accommodate a wide variety of scientific co-processors and peripherals for specialized functions. This includes high-resolution graphics, matrix processors, floating point co-processors, plotters, tape drives, digitizers, light pens, and analog-data capture units," states Carpenter.

To inspire consumer confidence in its new product, Micro Craft is backing up the Dimension 68000 with a full one-year warranty. The system is reliable, the company says, because it includes a multilayered, printed circuit board designed to eliminate most electronic noise and decrease the possibility of errors. There's also a 100-watt, 15-AMP power supply and a built-in fan to keep things cool.

Micro Craft has been impressed with the response to the Dimension so

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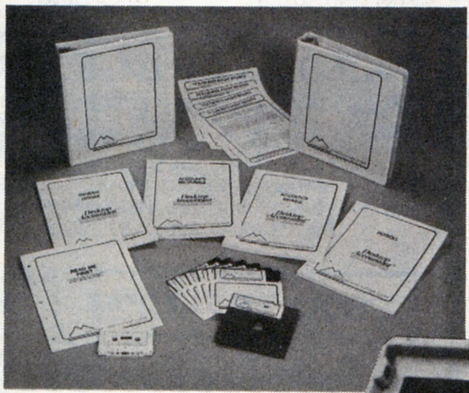

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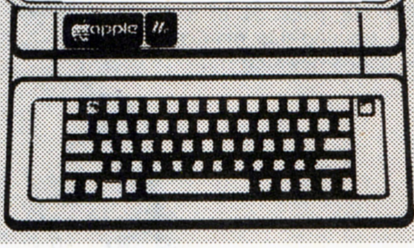

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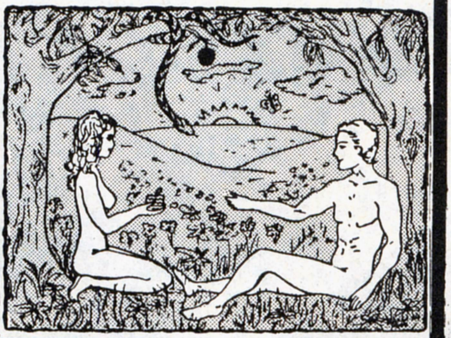

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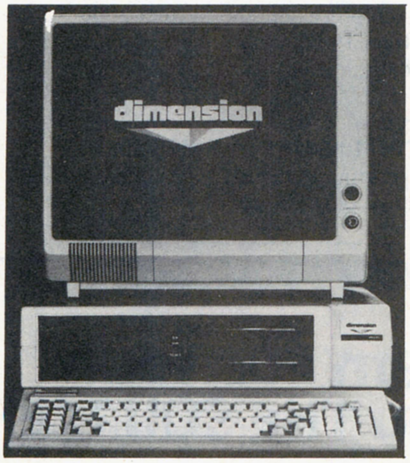
far. Dick Schaper, Dimension sales manager, says, "Over 1200 dealers have already contacted us because they see the Dimension as a 'hot machine,' a real advance over anything available before." Micro Craft expects to have a minimum of 100 Dimension dealers in place by the first quarter of 1984, and 440 by August of 1984.

First shown to the public last September at the Electronic Office and Computer Expo in Detroit, the product had been in research since January of 1982, when Carpenter, then the president of Scientific Machines Corporation, a manufacturer of powerful scientific computers, began to work on a concept which would ultimately result in the Dimension 68000. Carpenter wanted to develop a universal computer, one that would meet the needs of a large segment of the American computer-buying public for years to come. Carpenter ultimately decided to sell SMC and devote his 25 years of experience in electronics and computer design full time to the development of his product.



The Dimension 68000 handles a broad spectrum of software and peripherals.

The Dimension offers varying amounts of memory, and pricing starts at around $4000. For the basic retail price of $3995, users get 128k of RAM, and two 5½" floppy drives with 400k capacity each. You can get floppy disk storage of up to 10Mbytes, and one or two hard disks with 10- to 50Mbytes of space apiece. In the basic configuration, there's a built-in RS-232-C interface with full-duplex modem control, and a built-in Centronics parallel interface. A multiuser serial interface for up to 16 terminals is available as an option. The basic retail price also includes an IBM Selectric-type keyboard with a numeric keypad and 10 programmable

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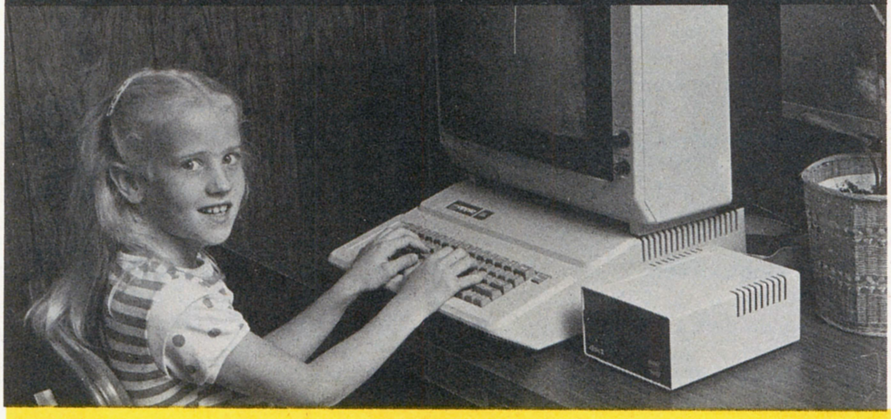

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CIRCLE 160

function keys, plus the CP/M-68k operating system.

The Dimension 68000 does not come with a monitor, but it has an RS170 composite video output to allow hookup to a TV. You can use a variety of monitors with the system, and it will give you from 20 to 92 characters per line under program control.

FOR MORE INFORMATION:
MICRO CRAFT CORPORATION, 4747 Irving Blvd., Suite 241, Dallas, TX 75247; (214) 630-2562

CP/M Companion

A 256k system, the CP/M Companion uses a Z80A microprocessor and operates disk drives. A 192k RAM disk, CP/M 2.2 and utilities on ROM disk, and the ability to read/write IBM, Kaypro, Morrow, and Osborne double-density disks are all built in.

The CP/M Companion connects between a terminal and a host computer to allow the terminal to run CP/M independent of the host. The CP/M Companion provides immediate disk access for portable computers. Weighing eight pounds, the Companion is transportable.

$1095
Companion Computers
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(919) 362-6655
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Dual 83/80

Designed as a high performance system, the 83/80 is MC68000-based and uses the UNIX operating system. It has two 80Mbyte hard disks, and 512k of dynamic RAM (with parity) expandable to 3.25Mbytes. Four-channel serial RS-232-C input/output boards use Direct Memory Access for all outputs. Twenty board slots are available in the system chassis.

$20,990
Dual Systems Corporation
2530 San Pablo Ave.
Berkeley, CA 94702
(415) 549-3854
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Kaypro II Plus 88
Kaypro 4 Plus 88

Users can choose between 8- and 16-bit modes of operation with these two new Kaypro systems. Both models have an 8-bit Z80 processor which runs CP/M software, and a 16-bit 8088 processor which runs MS-DOS software. In the 16-bit mode, the computer's RAM memory can be increased to 256k.

Both systems have 9″ high-resolution screens capable of displaying information 80 columns wide by 24 lines long, a professional keyboard, and two disk drives. The Kaypro II Plus 88 uses single-sided double-density disks, while the Kaypro 4 Plus 88 uses double-sided double-density disks.

$2000 (Kaypro II Plus 88)
$2200 (Kaypro 4 Plus 88)
Kaypro Corporation
533 Stevens Ave.
Solana Beach, CA 92075
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Monroe System 2000

Based on Intel's new 80186 microprocessor, the System 2000 offers 16-bit processing and modular configuration. As a modular system, the 2000 has a built-in capacity for expansion, and comes with the CP/M-86 DPX and MS-DOS operating systems for handling a wide range of software.

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The basic System 2000 includes two built-in dual-density floppy drives with 640k capacity per drive. Its basic memory capacity is 128k of RAM, which is expandable to 896k.

The 12″ amber monochrome video display screen has a tilt/turn pedestal for maximum comfort. The anti-glare screen has a 2000-character capacity, and a line resolution of 640 by 400.

The adjustable keyboard uses a standard typewriter arrangement, and has a separate numeric keypad with its own Enter key. There's a dedicated cursor pad and 10 application-defined function keys, which allow up to 40 different functions.

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Onyx 186 Series

This line of systems supports up to six users, and provides a multiuser version of Concurrent CP/M-86, OASIS-16, or MBOS/BB3. For a single user, it will run MS-DOS software.

The Onyx 186 supports peripherals from other manufacturers, and a basic configuration includes 256k of RAM and a 1Mbyte 5¼″ floppy drive. You can expand the system's RAM to 512k, add another 1Mbyte floppy drive, or add a Winchester with 7-, 14-, or 21Mbytes.

Included with the system is a new video display with a 14″, non-glare, blue or green phosphor screen. The monitor has tilt and swivel features. The keyboard detaches and has 104 sculptured keys, including a numeric keypad, a cursor-control keypad, 28 function keys, and a standard typewriter format.

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TPC 1

First announced last May, the TeleVideo Portable Computer (TPC 1) is now being produced in volume.

A key feature of the TPC 1 is its networking capability. An optional RS-422 network port allows the TPC 1 to be linked to a TeleVideo personal-computer network for access to shared files, printers, and electronic mail. The TPC 1 is software- and media-compatible with TeleVideo's TS803 family of personal computers.

The TPC 1 has a Zilog Z80A CPU and 64k of RAM, expandable to 128k. It can be purchased with one or two disk drives, and comes with the CP/M operating system and other software. This portable has a 9″ video display screen with 640- by 240-pixel high-resolution graphics, and the screen can display 24 lines of text with 80 characters per line.

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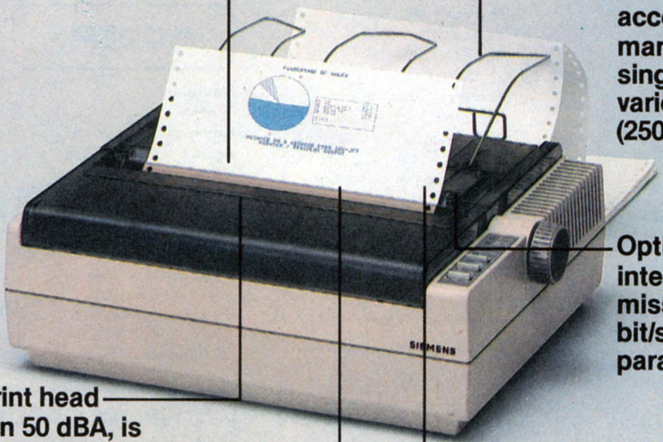

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The floppy drive of the Vector 4-S detects the type of disk being used and whether it was created in the MS-DOS or CP/M-86 operating system environment. The Vector 4-S will read 8- or 9-sector single- or double-sided CP/M-86 or MS-DOS disks with 48 or 96 tracks per inch.

The 16-bit CP/M-86 operating system is included with every system, and a disk-partitioning feature lets CP/M-86 and MS-DOS 2.0 reside on the same hard disk at the same time.

With dual 8-bit Z80B and 16-bit 8088 processors and 128k of RAM expandable to 256k, the Vector 4-S incorporates a detached keyboard and a green phosphor high-resolution graphics display. It has two modified S-100 expansion slots, a tone generator, an RS-232-C communications port, and one serial and two parallel printer ports.

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PERIPHERALS

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In a move expected by the company to have a significant impact on the growth of the portable and hand-held computer industry, Teletex Communication Corporation has announced the TTX 1280 Portaprint, a three-pound, battery- and AC-powered thermal matrix printer that makes mobile output possible for users of all leading brands of portable and hand-held systems.

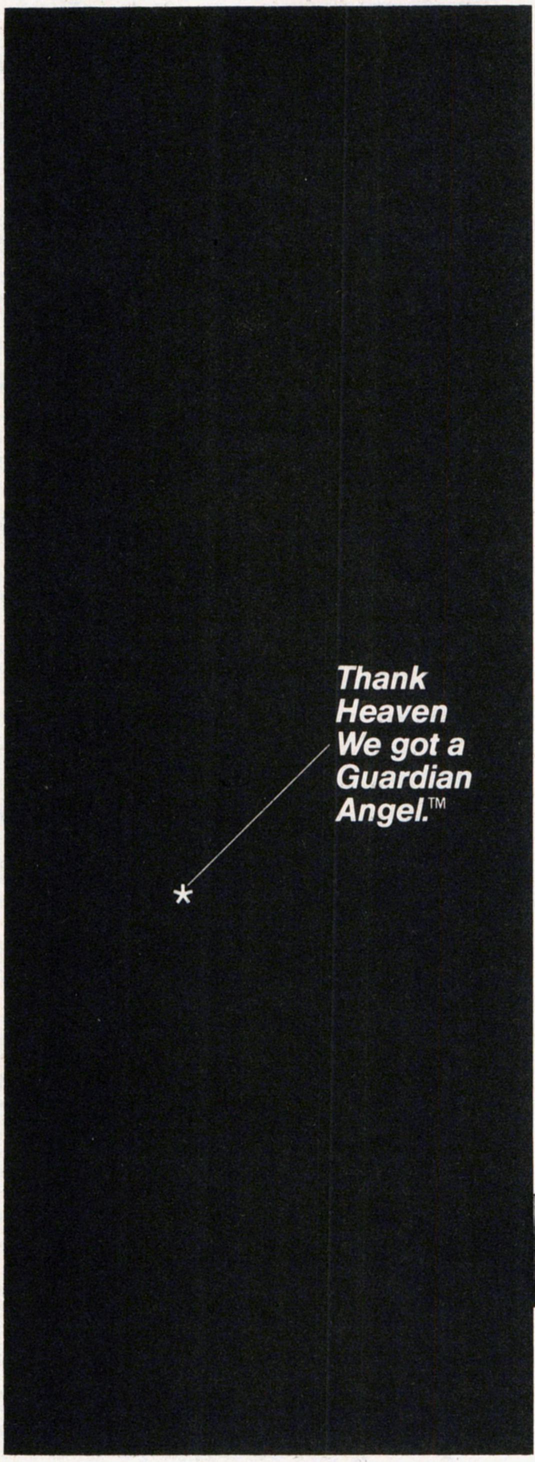
The battery-operation lets you use

(continued on page 254)

COMING IN FUTURE ISSUES

College-Level Computing

Some colleges now require that incoming freshmen buy or lease personal computers for use in the classroom. In our March issue we take a look at how and why students and faculty are using the machines, as well as how they *feel* about using them.



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	A2 Controller Card	$ 100	$ 79
	★A40, 160K, Drive	$ 449	$ 299
	★A70, 286K, Drive	$ 599	$ 299
	A40 A70 Controller	$ 100	$ 79
SUPER 5 1 2 HIGH	ALPS, A40, Belt Drive, 163K	$ 299	$ 199
	TEAC, T40, Direct Drive, 163K	$ 349	$ 239
	TEAC, T80, Double Sided, 326K	$ 449	$ 329
	Controller Card	$ 110	$ 59
Rana	Elite 1, 163K, 40 TK	$ 379	$ 249
	Elite 2, 326K, 80 TK	$ 649	$ 399
	Elite 3, 652K, 160 TK	$ 849	$ 499
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★ **ComX**, for IIe, 80 Col. + 64K RAM (IIe)	$ 295	$ 125
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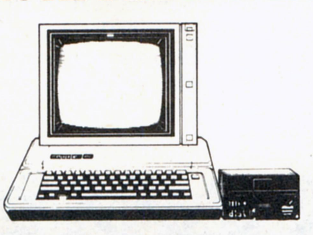

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★ 13" Color II, RGB, Hi Res	$ 529	$ 439
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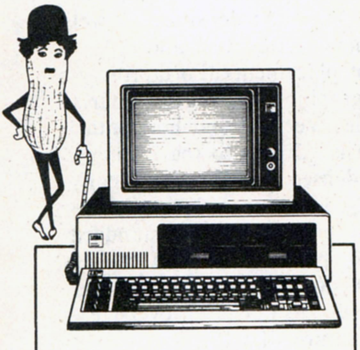

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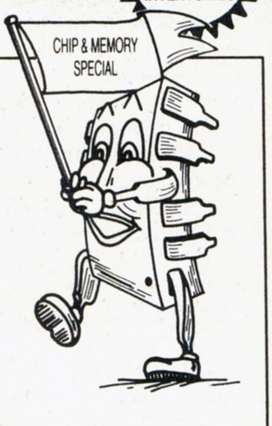

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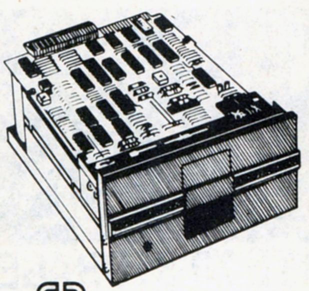

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CIRCLE 143

(continued from page 251)

the computer in remote, powerless locations, such as on a plane or in a car. Priced at $199, it prints 80 to 132 columns, and fits easily inside a briefcase, measuring 11″ by 1$\frac{3}{4}$″ by 4$\frac{1}{2}$″.

"With Portaprint," says Rhine Meyering, vice-president of marketing and sales for TTX, "we have combined the three most important requirements for a practical, successful portable printer: cost, portability, and functionality.

"Until now, fully functional printers have been too expensive, and too large or heavy for practical mobile usage . . . printers in the right price range have been underpowered or featureless. Portaprint is the first small, portable printer to combine computer-grade features with a price that's in line with portable computer retail costs," says Meyering.

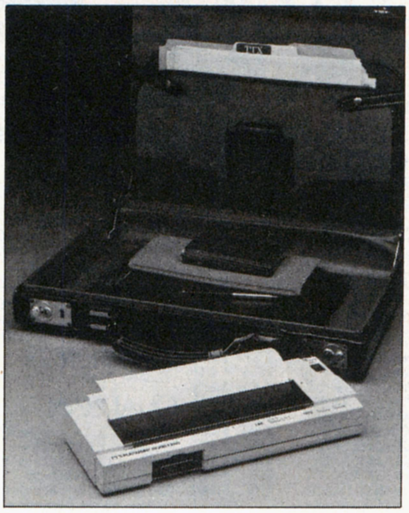
Portaprint provides a number of functional benefits that have never before been combined in an output device of its size, according to TTX.

For starters, the TTX 1280 Portaprint uses rechargeable or replaceable 6-volt batteries that provide between 4000 to 5000 lines of print before needing recharging or replacement. The printer can also be powered through a standard AC outlet.

Though it is small and portable, Portaprint's speed is far from slow. In battery mode, the bidirectional printer features a print speed of up to 40 cps. Powered through an AC outlet, Portaprint can do 80 cps.

For its size and cost, Portaprint performs some sophisticated functions. Using quiet, non-impact thermal printing technology with a five-by-seven matrix print head, Portaprint can produce a variety of character sizes and densities, as well as specialized letter, line and dot-by-dot placements. Portaprint features graphics printing for charts and graphs. Vertical and horizontal resolution is 72 dots to the inch. With condensed printing, users can place 132-column spreadsheets and other wide printouts within standard 8$\frac{1}{2}$″ by 11″ paper. Portaprint can do bold or shadow printing to highlight report headings. It has an oversize printing feature that lets users enlarge characters to virtually any height or width.

Portaprint hooks up to a computer via an RS-232 serial or Centronics parallel interface. Besides the leading lap-size systems, Portaprint works with any computer that will support RS-232 or Centronics interfaces. Meyering says that with its speed and capabilities, Portaprint will serve most desk-top systems well. "It's a



AC- or battery-operated, the TTX 1280 printer weighs only three pounds.

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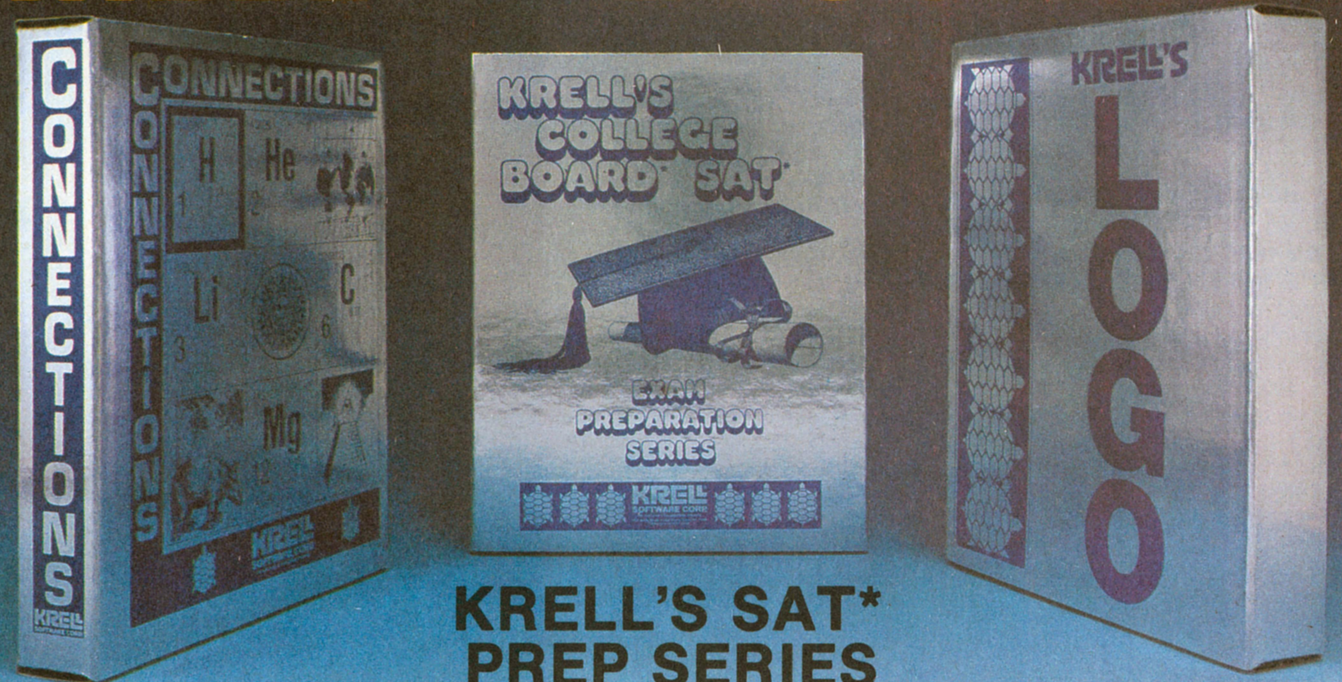

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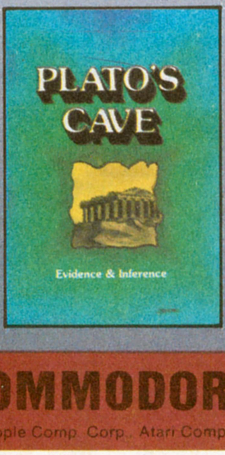

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business printer which just happens to be very compact and silent," says Meyering.

The TTX 1280 Portaprint will be available in the second quarter of 1984 through Teletex's growing dealer and distributor retail channels.

FOR MORE INFORMATION:
TELETEX COMMUNICATION CORPORATION, 3420 E. Third Ave., Foster City, CA 94404; (415) 341-1300

CR-1810 ComScriber I
This lightweight, compact plotter produces high-resolution charts, graphs, and illustrations in several colors. Line segments are accurate to 1/4000 of an inch.

ComScriber draws at a speed of up to 6″ per second on paper 8½″ wide by 1″ to 10′ in length.

$695
Comrex International Inc.
3710 Skypark Dr.
Torrance, CA 90105
(213) 373-0280
retail

Dascon-1
Plugging directly into the IBM Personal Computer, this analog and digital input/output board allows the user to perform data acquisition and control. The Dascon-1 permits the programmer to access 12 digital I/O lines, 2 analog outputs, and 4 differential analog inputs per board at a throughput of 16 channels per second. The board includes a battery back-up, real-time clock/calendar.
For IBM Personal Computer

$485
MetraByte Corporation
254 Tosca Dr.
Stoughton, MA 02072
(617) 344-1990
mail order

Era 2
There are two versions of this communications system—one for the Apple IIe and one for the IBM Personal Computer. Era 2 includes communications software, a 1200-baud modem board, a user's manual, and a telephone cord. The modem is Bell 212A- or 103-compatible, and can accommodate full- or half-duplex transmissions up to 1200 baud. Era 2 provides asynchronous auto-answer, originate-answer, and pulse or tone dialing.

The Apple IIe version requires a clock card, DOS 3.3, 64k of RAM, and one to four disk drives. The IBM version requires 128k of RAM, one drive, and PC-DOS 2.0.

$429
Microcom, Inc.
1400A Providence Hwy.
Norwood, MA 02062
(617) 762-9310
retail

LVS 76.8
With a standard RS-232 interface, the LVS 76.8 modem transmits at speeds up to 76.8k bps. You can choose from eight transmission rates, and this modem transmits in half- and full-duplex. It conforms to Bell 43401 protocol.

$650
Complexx Systems, Inc.
4930 Research Dr.
Huntsville, AL 35805
(205) 830-4310
retail

NEC JC-1460DA
A medium resolution, RGB direct-drive color monitor, the JC-1460DA offers 500-by-240 vertical resolution. The 14″ monitor also offers an 80-column by 25-line

This new software package is ruining my business! *...but it's great for yours*

You know, us spies have a tough enough time as it is, getting valuable information...now there's this new software package, SUPER ENCRYPTOR, a file scrambler for CPM or MS DOS. Now you can have real file security for all your proprietary information.

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HEROISM IN THE MODERN AGE

THE ROLE-PLAYING GAME OF TODAY

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- The first truly complete computerized role-playing system.
- A multi-character role-playing game which is vast in scope, allowing hundreds of incredibly detailed characters of your own creation.
- A sophisticated simulation of modern life and human psychology.
- A test of creative thinking and imagination.
- A game designed especially for the IBM PC*
- The only system realistic enough to be believable in *real-life* rather than a fantasy setting.

Your Starter Pack contains 2 full diskettes and detailed manuals. The game has 2 parts:

1. BASIC MODULE — which allows you to create characters and guide them through their lives. You can have the computer create characters — giving them names, a family background, and psychological and physical makeup — or you can custom-design characters, perhaps to represent people in real-life.

2. PROJECT CONTACT Scenario #1 — which allows you to take characters from the Basic Module or pre-created characters on a secret mission to save the United States from a mad scientist and a terrorist plot. You must use all of your character's abilities and skills and technological tools to find clues, persuade allies, question suspects, fly helicopters and fight battles. You have only 60 hours to complete your mission...

HEROISM IN THE MODERN AGE is expandable, with other modules available.

MORE THAN JUST A GAME...

PROJECT CONTACT Scenario #1

SYSTEM REQUIREMENTS:
IBM PC with one double-sided or two single-sided disk drives, an 80-column monitor, and 64K RAM (96K for DOS 2.0).*
Color graphics/adaptor optional

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British Technology for American Results. Interpod and Petspeed are distributed in the United States by Limbic Systems, Inc. Dealer and school discounts are available.

Limbic Systems Inc.

560 San Antonio Road, Suite 202 Palo Alto, CA 94306
(415) 964-8788

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CIRCLE 67

display, and 8-by-8 dot characters.
For NEC-HE, PC-8000, PC-8800; IBM Personal Computer
$499
NEC Home Electronics, Inc.
Personal Computer Division
1401 Estes Ave.
Elk Grove Village, IL 60007
(312) 228-5900
retail

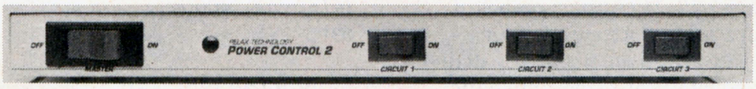
PC212A Modem
An intelligent modem designed specifically for use with the IBM Personal Computer, the PC212A is auto-dialing, auto-answer, and auto-log on, and comes with a free software package. Completely Bell 212A compatible, the PC212A stores up to 10 telephone numbers and operates from 300 bps to 1200 bps. The PC212A features a second optional EIA RS-232C asynchronous serial port and an internal microprocessor for optioning the modem from the keyboard.
For IBM Personal Computer
$499 single port
$539 additional asynchronous port
Rixon Inc.
2120 Industrial Pkwy.
Silver Spring, MD 20904
(301) 622-2121
retail (available at ComputerLand stores)

Quick Disk
An external add-on memory device, Quick Disk is a disk cache system that contains semiconductor memory (RAM) ranging from 128k to 1Mbyte. It can be used independently as an additional data storage unit or in combination with a floppy or Winchester drive.
For IBM Personal Computer
$2795 (128k)
$8595 (1Mbyte model)
Santa Clara Systems
1860 Hartog Dr.
San Jose, CA 95131
(408) 287-4640
retail

RGBVision 210
An RGB and composite combination monitor, the 210 has an RGB mode, which is Apple II Plus- and IIe-compatible, and has a medium resolution of 380 horizontal lines. The composite mode is NTSC standard with 2-watt audio output. The 210 comes with a removable glare-screen.
$399
TSK Electronics Corp.
18005 Cortney Ct.
City of Industry, CA 91748
(213) 810-1291
retail

The Controller

Controls Power, Peripherals, Spikes, and Glitches.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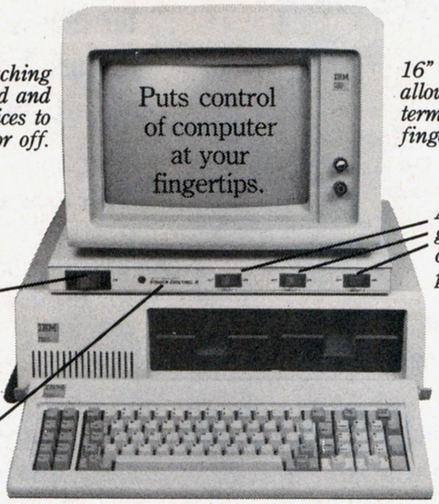
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R212A Modem

The R212A intelligent modem is a stand-alone unit with features similar to Rixon's PC212A, plus on-board software to support auto log-on sequences for direct single-key dialing into computer ports and automatic number linking.

$499

Rixon Inc.
2120 Industrial Pkwy.
Silver Spring, MD 20904
(301) 622-2121
retail (available at ComputerLand stores)

SDD Color Digitizer Board

This color graphics interface digitizes images from a television camera or other video source. The user can digitize and store images of up to 484-vertical by 754-horizontal resolution. Output can be stored on disk or in memory, or transmitted through a serial interface to another machine. Based on the S-100 bus standard, the SDD board can be used in any of Cromemco's bus-structured systems.

For Cromemco

$995

Cromemco, Inc.
280 Bernardo Ave.
P.O. Box 7400
Mountain View, CA 94039
(415) 964-7400
retail

Signalman Mark XII

Designed to provide efficient, trouble-free telephone communication for the personal-computer owner, the Mark XII modem emulates the same command structure as the Hayes Smartmodem, with some additions. The Mark XII can be operated manually through the keyboard without computer coding. It also operates automatically to answer or originate calls at 1200 bps for Bell 212A compatibility and up to 300 bps for Bell 103. The Mark XII detects dial tone and busy signals, displaying dialing status on the CRT.

$399

Anchor Automation
6913 Valjean Ave.
Van Nuys, CA 91406
(213) 997-6493
retail

64 Expander

With one horizontal and three vertical expansion slots, the 64 Expander lets Commodore 64 owners add a variety of software and expansion peripherals. The vertical slots, controlled by large slide switches, provide ready access for insertion or removal of standard-size cartridges. The horizontal slot allows large bulky cards, such as an 80-column video converter, to rest safely on the table top.

For Commodore 64

$79.95

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BITS & PIECES

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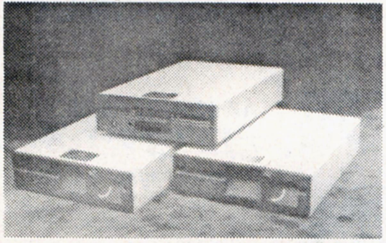

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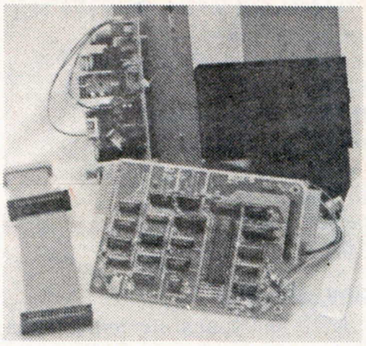

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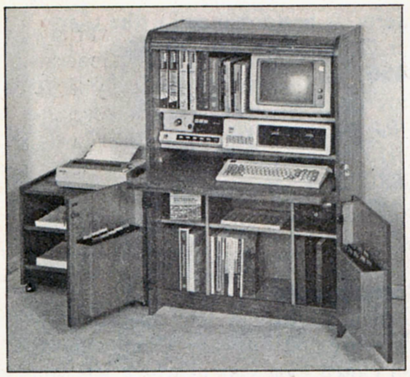


Designed for IBMs, the MicroBase II workstation has a locking rolltop.

dust-free environment. Adjustable shelving inside the workstation lets you have your equipment at a convenient level. For a smart appearance, the desk top slides out of the workstation when you need it and can stay inside when you don't. Swing-out doors at the bottom of the unit have attached storage compartments which are useful for keeping important papers. There are cutouts in back of the unit for ventilation, plus wire/cable management.

MicroBase II comes in a choice of teak or western oak wood veneer finishes, and is strengthened by its screw and dowel construction. According to Microplex, MicroBase II follows the sales success of MicroBase I, a workstation custom-designed for portable computers.

Microplex plans to introduce more products in the MicroBase line, including an acoustical printer enclosure, shelving, and roll-top media storage units. The complete MicroBase line will be constructed of the same matching wood veneers.

The suggested list price for MicroBase II is $795.

FOR MORE INFORMATION:
MICROPLEX, INC., One World Trade Center, Suite 7967, New York, NY 10048; (212) 524-7776

CommPort

Providing RS-232 and Centronics parallel connectors, CommPort lets the WorkSlate system communicate with devices that support serial or parallel communications protocols.

The new module features large switches and configurable switch settings to simplify the configuration of communications between separate devices, and to provide access to a greater number of peripherals. Configurable switch settings allow you to set up baud rate, parity, and hardware protocol selections for maximum communications capabilities.

For Convergent WorkSlate
$200
Convergent Technologies
2441 Mission College Blvd.
Santa Clara, CA 95050
(408) 980-9222
retail

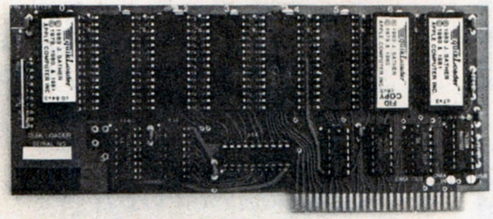
Computer Interface Module 112

Designed to help users save up to 25 percent on their energy bills, this device will regulate lights and appliances, turn on a sprinkler system or water heater, and perform other business- or home-control functions.

The CIM 112 saves energy through its scheduling capabilities and through duty cycling, a timing control method which makes more efficient use of energy.

The CIM 112 is comprised of a computer interface module which plugs into the computer, a wall mount unit, and cassette or disk software. An LED visual read-out panel

SCRG
quikLoader



SPEED
The quikLoader is the *fastest* way to load programs, ***BAR NONE!*** Applesoft, Integer, or machine language programs can be loaded in fractions of a second. More importantly, DOS is instantly loaded every time the computer is turned on. Integer is even loaded in the language card. This process takes less than a second, saving valuable time. The quikLoader operating system can keep track of over 250 programs stored in **PROM**s (Programmable Read Only Memory). The user simply transfers any of these programs to PROM using the instructions packed with the unit, and any PROM programmer, or we will provide this service.

CONVENIENCE
How many times have you started to work with a frequently used program, only to find that you have misplaced the disk, or worse, had the disk damaged, or the dreaded "I/O ERROR" message flash on the screen. With the quikLoader, these nightmares can be a thing of the past. Frequently used programs are available *instantly* when you need it, without having to look for the disk, or hoping that the lengthy disk loading procedure goes smoothly. If you do need to use standard disks, the quikLoader even speeds up that process. For example, to catalog a disk, just press ctrl-C Reset. To run the "HELLO" program, press ctrl-H Reset. Other "one-key" commands include entering the monitor, booting the disk, calling up the mini-assembler, etc. The major difference between the quikLoader and the other ROM cards is the complete operating system (in PROM). This enables you to get the quikLoader catalog on the screen (by pressing ctrl-Q Reset), allowing you to see what programs are available. Loading or running of the desired program requires one keypress. Program parameters, such as starting address and length of machine language programs can be seen on the catalog screen, if desired.

EASE OF USE
The quikLoader plugs into any slot of the APPLE] [or //e. The card is reset driven. To use any of the many features of the card, RESET is pressed in conjunction with a key. The particular key pressed chooses the feature.

VERSATILE
The quikLoader will accept any of the popular PROMS available on the market, 2716, 2732, 2764 and 27128. These types may be freely intermixed on the card. Long programs can take up more than one PROM, or several short programs may be stored on one PROM. The quikLoader operating system even handles multiple cards, so you can easily double or triple the amount of PROM memory available. The ultimate memory capacity of one card is 128K, so many frequently used programs and utilities can be stored. We even start your library of programs with the most popular utilities on the card, FID and COPYA. Now, if you have to copy a disk, you don't have to search for the master disk. You can start copying within 3 seconds after turning on the computer.

INCREASED DISK CAPACITY
Since DOS is loaded from the quikLoader every time the computer is turned on, it is not necessary to take up valuable disk space with DOS. This will give you more than 10% additional space for programs and data on your disks.

SYSTEM REQUIREMENTS
The quikLoader will work in an APPLE] [,] [+, or //e. If used in a] [+, a slightly modified 16K memory card is required in slot 0. A disk drive is required to save data.

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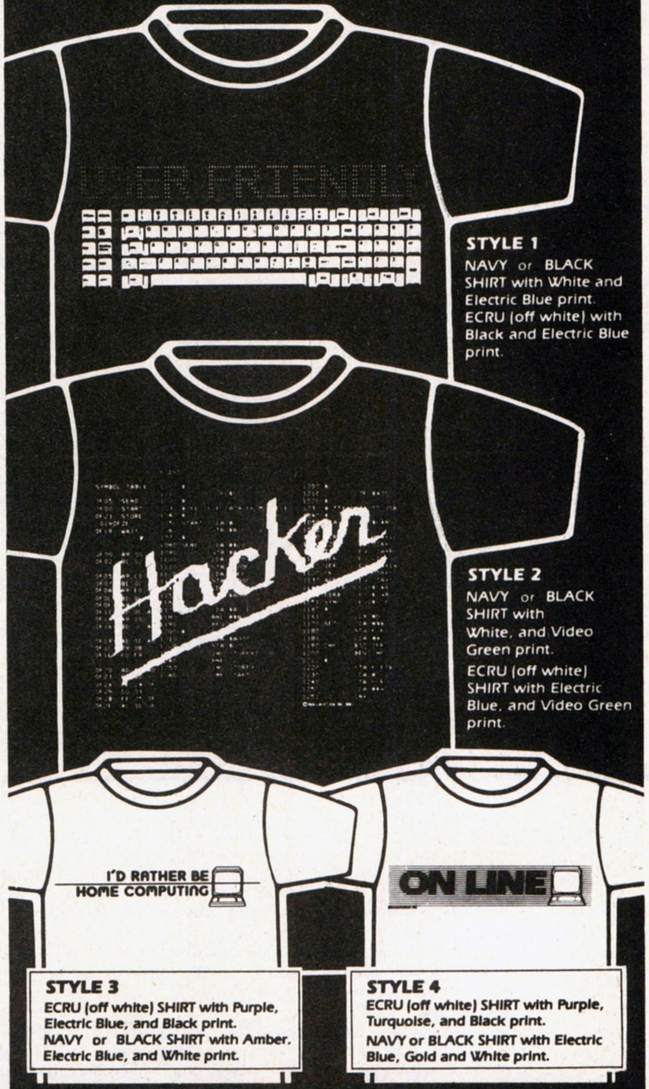

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Compuguard comes with a manual and flexible software to allow you to customize installation.
For Commodore 64; Atari 400, 800
$145
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Suite 130
Richardson, TX 75081
(214) 235-0797
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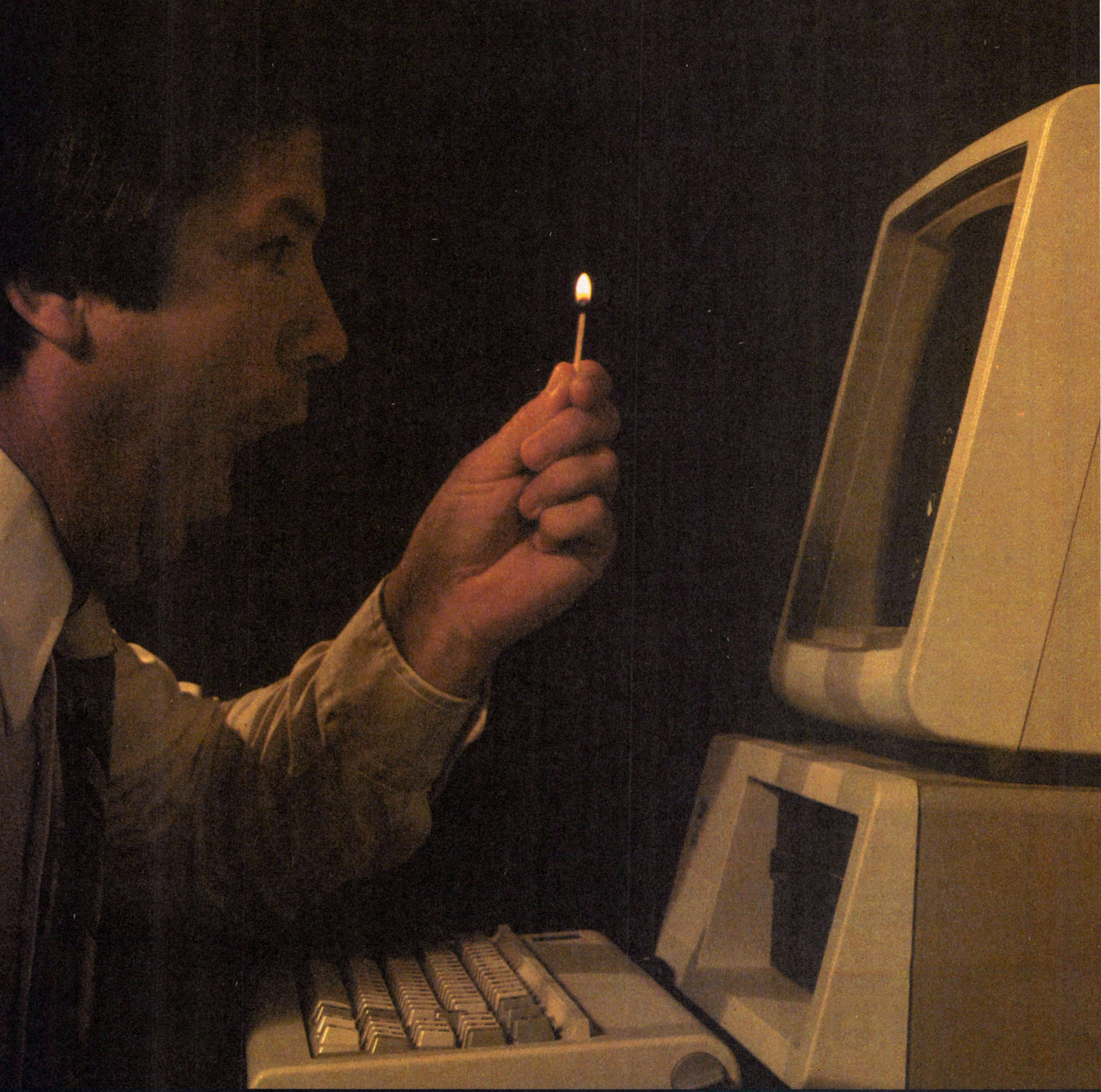
Don't get caught in the dark.



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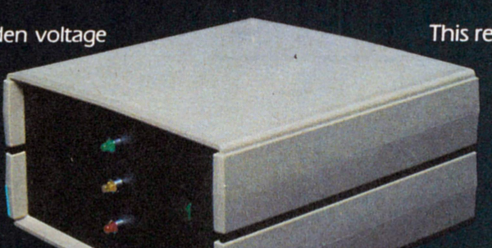

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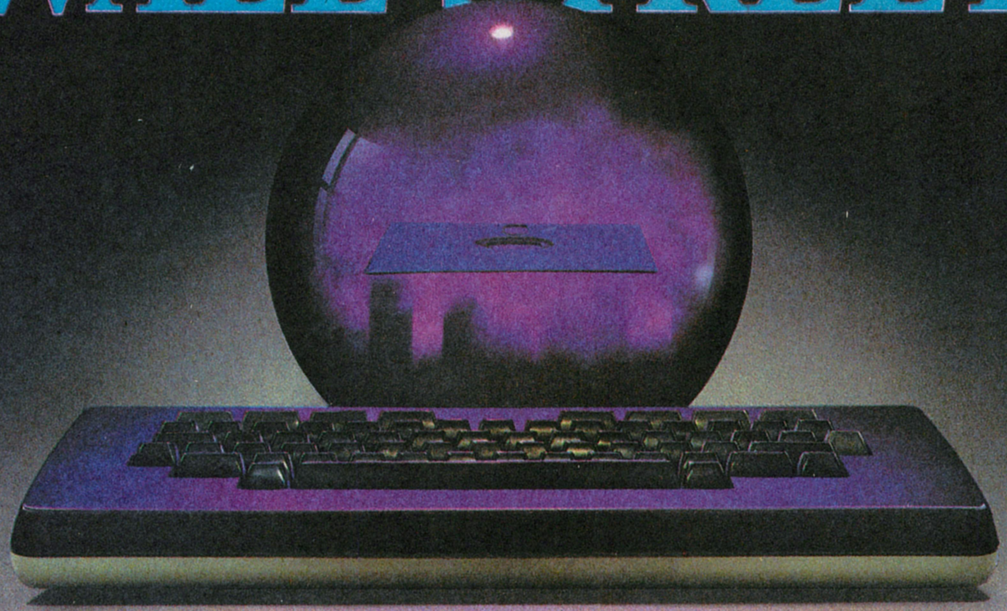

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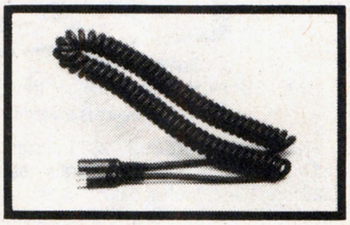

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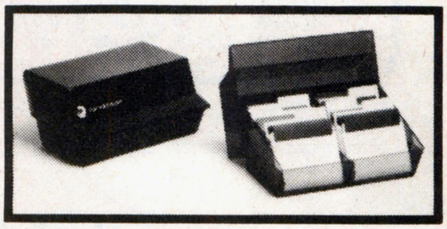

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CIRCLE 4

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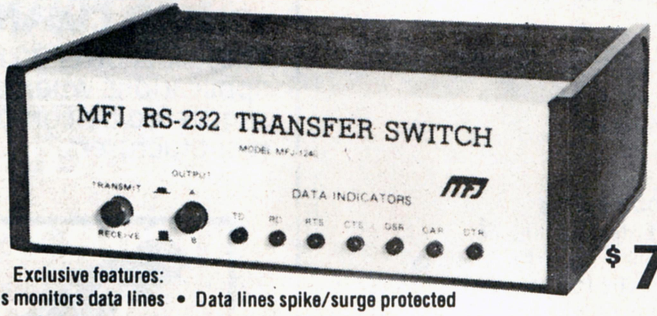

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CIRCLE 45

The commands, summarized on a single card, let users print out information in any form, as well as send and receive information in any form, without ever leaving the common-command environment. The user can access and use different applications at any time and in the same work space or file, without the annoyance of cluttered windows or complicated "cut and paste" methods. Data entered into spreadsheets can easily be turned into graphs, or inserted in a letter, all on the same screen.

"Today's professional does not have the time or interest in learning complicated, technical terminology and extensive commands for one task, let alone repeat the learning process for additional tasks," says Thomas J. Gregory, president of Ovation. "In essence, users want a system that acts human and performs computer."

Ovation runs on the IBM Personal Computer or XT with 2.0 DOS, 256k, and two drives (or hard disk on XT). The package will display color graphics with a color graphics adaptor and color monitor, and can be configured to work with any printer. Ovation retails for $795.

FOR MORE INFORMATION: OVATION TECHNOLOGIES, 770 Dedham St., Canton, MA 02021; (617) 821-1420.

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If, instead, you type "Moved" somewhere in each appropriate record and define a subset of "not equal to Moved" for your printout, a great deal of room, and time, will be saved by not entering all those X's.

This reverse thinking works well. The particular form it takes in each program will vary, but you'll find the commands under Relational Operators or Boolean in your documentation's index.

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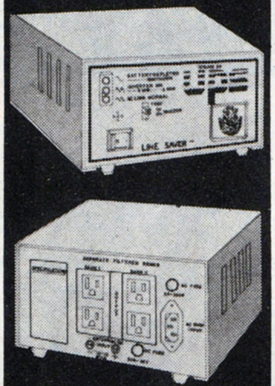

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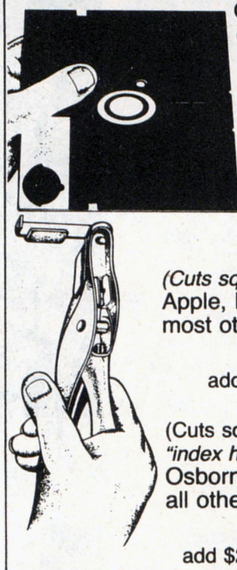

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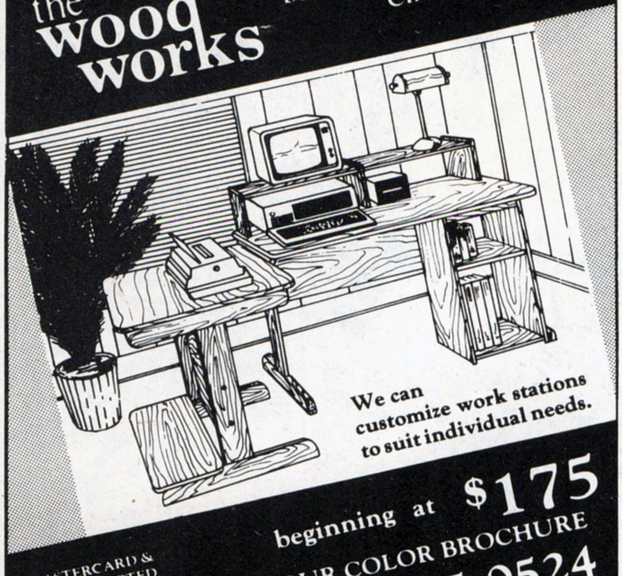

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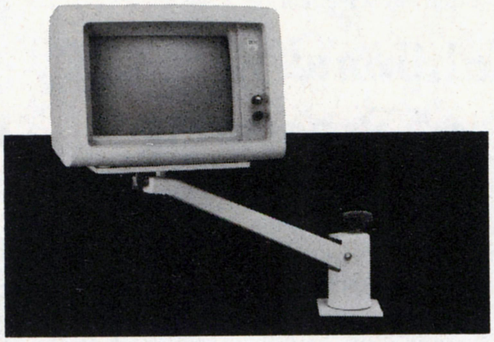

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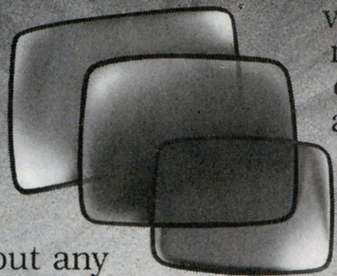

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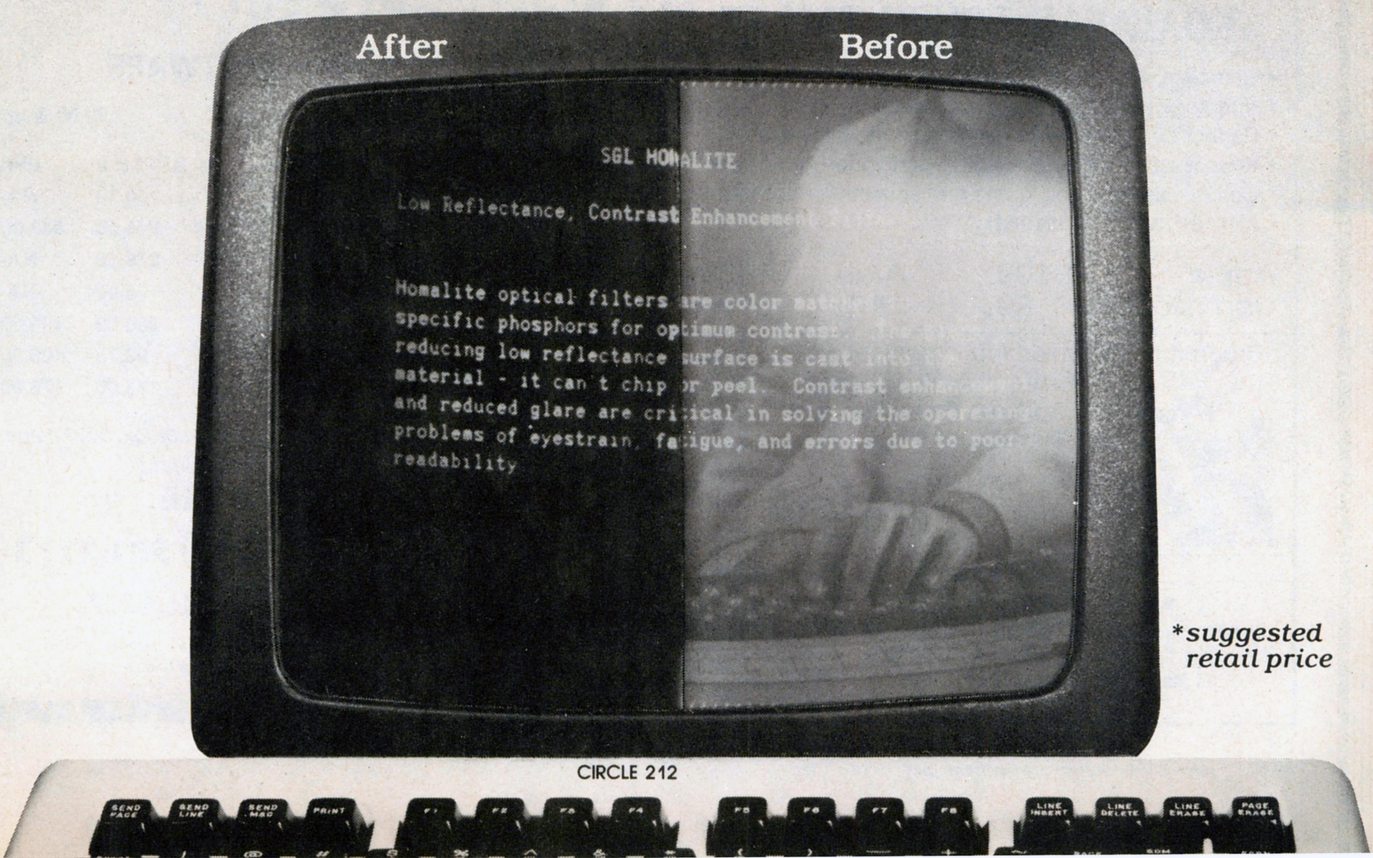

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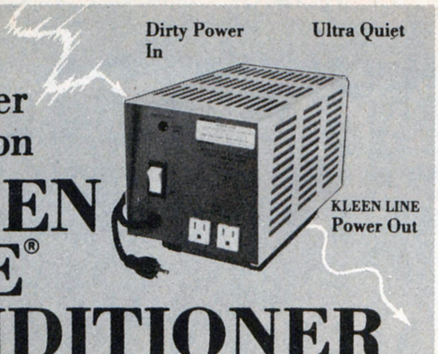

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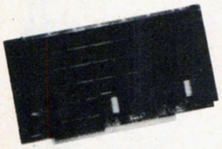

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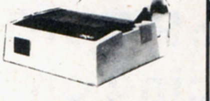

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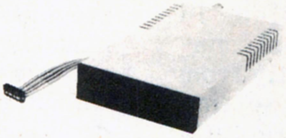

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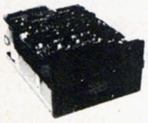

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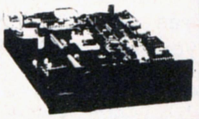

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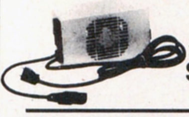

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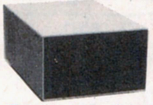

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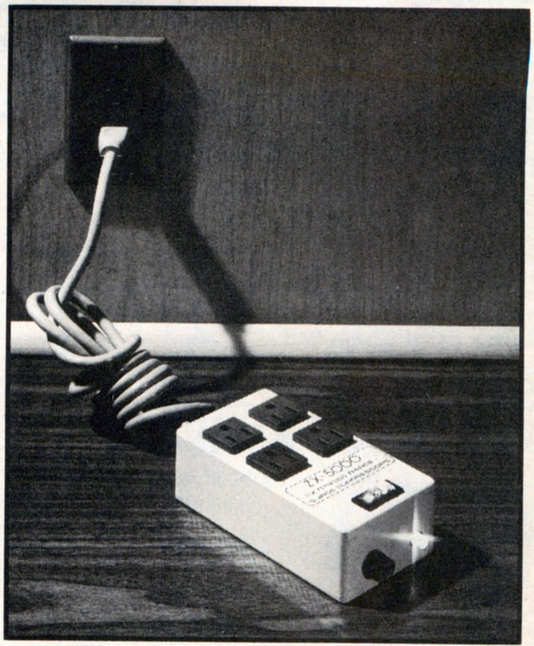

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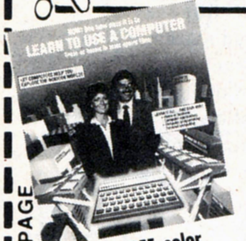

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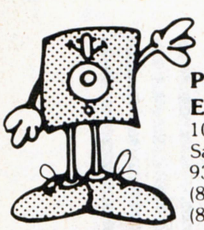

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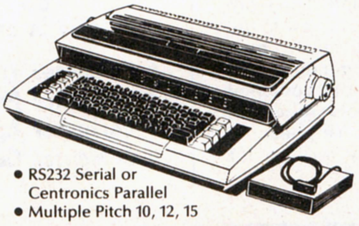

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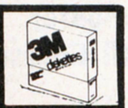

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Are you a running fanatic? Well then maybe you'd like some expert advice. The Running Program, from Micro Education Corporation of America, is authored by James F. Fixx—a name well known to almost anyone who is into running. Fixx is the health and fitness expert who authored the best-selling book *The Complete Book of Running*.

The Running Program is designed to provide serious runners, and even the casual jogger, with the equivalent of a personal running coach to help set individualized fitness goals. These goals include doing things like creating a day-by-day training calendar, keeping training records, graphing progress, and predicting race finish times at any distance. The program was developed to provide comprehensive health and fitness guidelines to runners of all levels of ability and training, so it can be used by several members of the family or a group of runners.

"When I was writing the *The Complete Book of Running*," says Fixx, "I found myself wishing I could somehow sit down with the individual runner and provide a truly personalized training program. In a book, however, there was simply no way to do that. Now, at last, there is a way, as The Running Program demonstrates."

In addition to creating a training schedule and graphing achievement statistics, The Running Program helps you select the right equipment for different weather and distance conditions. The program also helps to prepare you properly for the physical strain of any distance run, minimizing the chance of running injuries. The package even evaluates diet to help you aim for optimum weight and fitness.

If you're really serious about running, The Running Program will let you compare your performance to world class and Olympic competitors. Should you decide against competing at a world-class level, you may just want to compare your running stats with the guy next door.

Fixx's *The Complete Book of Running* has sold over a million copies in the United States and abroad, and he has authored six other publications since 1972. He has also received the President's Council on Physical Fitness Award.

The Running Program is a two-disk package for the IBM Personal Computer, XT, and PCjr. The program has a suggested retail price of $79.95 and is available from dealers. Apple, Atari, and Commodore versions are also planned.
FOR MORE INFORMATION: MICRO EDUCATION CORPORATION OF AMERICA, 285 Riverside Ave., Westport, CT 06880; (203) 222-1000

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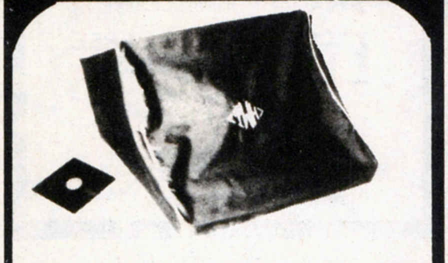

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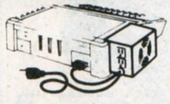

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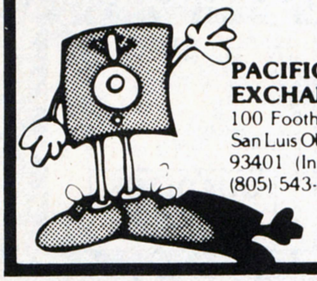

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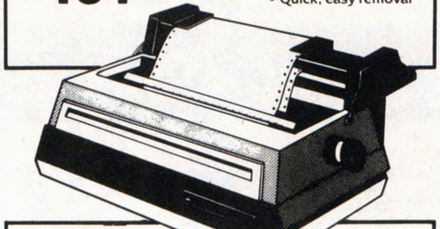

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For TI-99/4A
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Mystery Island

Mystery Island is an all-text adventure game in which you try to escape from being stranded on a remote tropical island. If you make the correct choices and are adventurous enough, you can recover hidden treasures as well.

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$24.95
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48 Baker Rd.
Livingston, NJ 07039
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Persuasion
Combining fast action with subtle strategy, Persuasion provides you with a wide variety of situations and challenges on multiple difficulty levels. The game features multiple screens, a freeze command, and a toggle sound command. It can be played on monochrome or color displays.
For IBM Personal Computer, XT
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Amherst, MA 01004
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Plain Vanilla Games
Plain Vanilla Games is four-game package containing "ridiculously slow and simple games," according to Anything Software. Wandering Snails, for example, is a molasses-paced version of an arcade-style motorcycle race. Robin Hood Challenge has you guiding an arrow on speeds which range from "ho-hum" to "medium slow." Other games include Beginner's Space Walk and Draw-Verlaps.
For Apple IIe and II Plus with joystick
$17.50
Anything Software Company
P.O. Box 60219
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Restoration Record
This program is designed to help the car enthusiast keep records on each car in his "stable." The user can retrieve, add, change, or print information on parts or service obtained, where parts were purchased, and the like. There are also provisions for entering historical data such as production figures and serial numbers.
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Return to Pirate's Isle
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For Atari 400, 800, 1200
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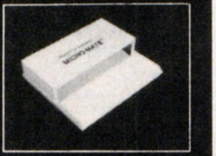

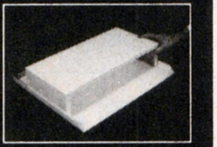
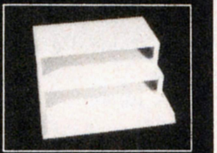

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How can your personal computer help you become a better writer? More important, how can you use your computer and word-processing software to help your *children* become better writers? Find out in our April issue.

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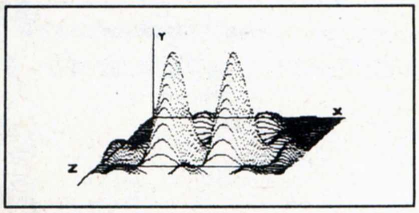

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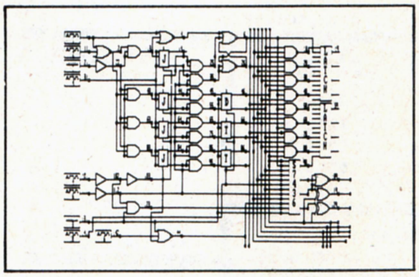

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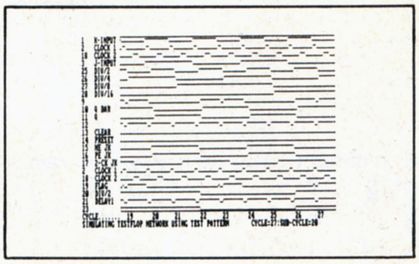

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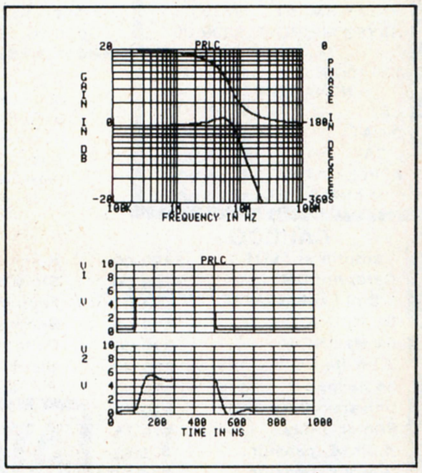

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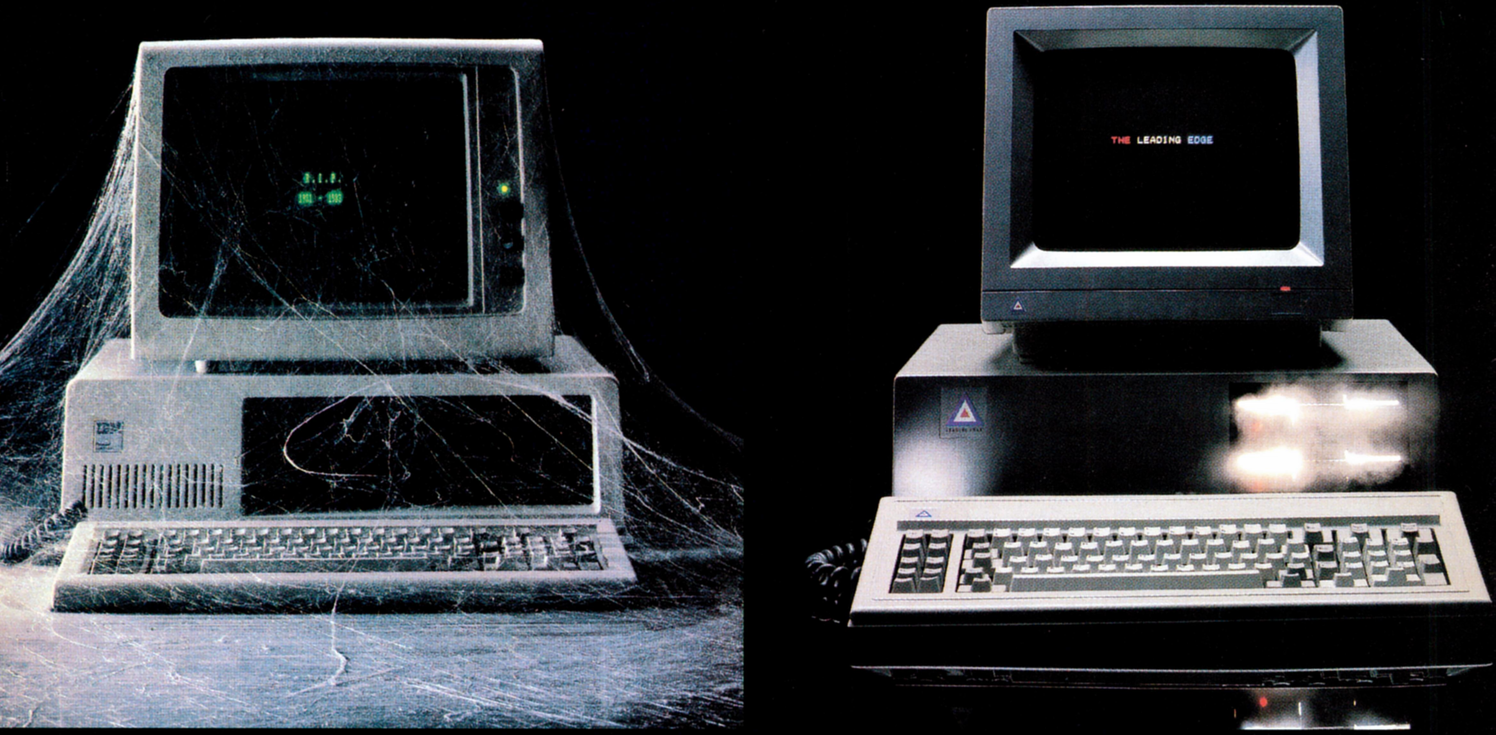

It was a monday in the autumn of '83:

The day they announced the Leading Edge® PC—a personal computer that's just plain better than the IBM® PC, at just about half the price.

The Leading Edge PC is faster (by more than 50%), more powerful, more flexible and more dependable (for example, our disk drives have a "mean time between failures" of 20,000 hours, versus an 8,000-hour MTBF for theirs). It's compatible with just about all the software and peripherals that the IBM is.

And unlike IBM's, ours comes complete with a high-resolution monitor, controller, seven expansion slots, serial port, parallel port, a time-of-day clock, double the standard memory (128K vs. 64K), plus hundreds of dollars worth of software to get you up and running immediately including MS®-DOS version 1.25, GW Basic, and Leading Edge Word Processing (the most powerful w.p. program ever created to run on an IBM-type personal computer). In short, the basic package comes to you complete and ready to work.

With IBM, on the other hand, you get charged extra for everything. Even for the PC-DOS disk that makes it run (an extra $40) . . . and $170 just for the time of day (a calendar/clock that's standard with Leading Edge). In short, the basic package comes to you as a very expensive paperweight.

It's this simple: The Leading Edge Personal Computer is the first and only serious alternative to the IBM PC . . . and at only $2895 for the Leading Edge PC . . .

Get serious.

In the age of the personal computer, Leading Edge, means what it says.

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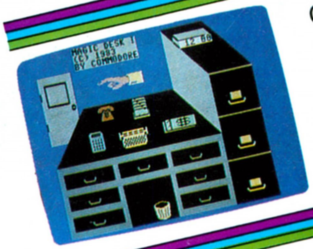
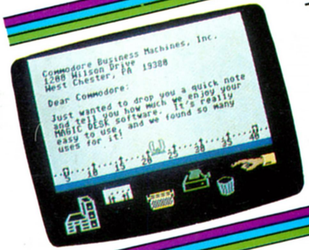
CIRCLE 18

Commodore 64 Magic Desk I

Only From Commodore—The Excitement and Simplicity of Magic Desk!


MAGIC DESK I
(C) 1983
BY COMMODORE
12:00

Only Commodore brings you the magic of MAGIC DESK . . . the next generation of "user friendly" software! Imagine using your computer to type, file and edit personal letters and papers *without learning any special commands!* All MAGIC DESK commands are PICTURES. Just move the animated hand to the picture of the feature you want to use (like the TYPEWRITER) and you're ready to go.



Commodore Business Machines, Inc.
1200 Wilson Drive
West Chester, PA 19380

Dear Commodore:

Just wanted to drop you a quick note and tell you how much we enjoy your MAGIC DESK software. It's really easy to use, and we found so many uses for it!

5
10
15
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25
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35
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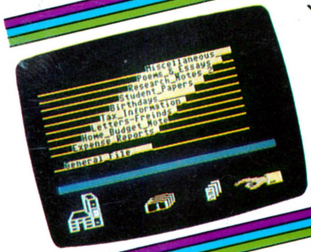
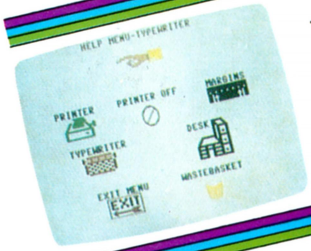
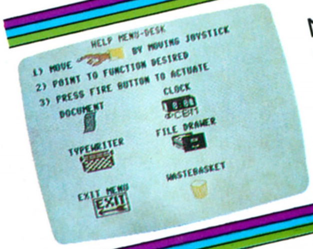
The MAGIC DESK Typewriter works just like a real ELECTRIC TYPEWRITER . . . and it's COMPUTERIZED. All the filing is *electronic*. Excellent sound effects and screen animation make typing fun, whether you're typing letters, reports or memos . . . and the built-in filing feature makes MAGIC DESK useful for keeping names and addresses, home inventory lists, insurance information and more.


Miscellaneous
Poems_&_Essays
Research_Notes_2
Student_Papers
Birthdays
Tax_Information
Letters-Freinds
Home_Budget_Note
Expense_Reports
General_File

Your COMMODORE 64, COMMODORE DISK DRIVE and MAGIC DESK are an unbeatable combination. Filing operations are automatically linked to your Commodore disk drive—but you don't have to know any commands—just "file" the pages you type in the file cabinet and your text is automatically saved on diskette. There are 3 file drawers with 10 file folders in each drawer and 10 pages in each folder.


HELP MENU-TYPEWRITER
PRINTER
PRINTER OFF
MARGINS
DESK
TYPEWRITER
WASTEBASKET
EXIT MENU
EXIT

To PRINT a page you've typed, just "point" at the picture of the printer and your pages are automatically printed on your COMMODORE PRINTER or PRINTER/PLOTTER. If you want to erase what you've typed, the WASTEBASKET under the desk lets you "throw away" pages. There's even a DIGITAL CLOCK which helps you keep track of time while you're typing.



HELP MENU-DESK
1) MOVE BY MOVING JOYSTICK
2) POINT TO FUNCTION DESIRED
3) PRESS FIRE BUTTON TO ACTUATE

CLOCK
DOCUMENT
FILE DRAWER
TYPEWRITER
WASTEBASKET
EXIT MENU
EXIT

Not only is MAGIC DESK easy to use . . . it's hard to make a mistake! Just press the COMMODORE key and one of several "help menus" appears to tell you exactly what to do next. Special messages show you how the various picture commands work and help you when you make a mistake. Help messages also show you how to use the printer, filing cabinet, digital clock and wastebasket.

Experience The Magic At Your Local Dealer.

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CIRCLE 77